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NAME OF SUPERVISOR/*NOM DU DIRECTEUR DE THÈSE* Dr. JR Young

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THE UNIVERSITY OF ALBERTA

AN EVALUATION OF THE INDUSTRIAL ARTS PROGRAM IN THE GOVERNMENT SECONDARY SCHOOLS IN GUYANA

by

© LEYLAND F. THOMPSON

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH

IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE

OF MASTER OF EDUCATION

IN

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EDMONTON, ALBERTA

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THE UNIVERSITY OF ALBERTA

FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled "An Evaluation of the Industrial Arts Program in the Government Secondary Schools in Guyana" submitted by Leyland Fitzgerald Thompson in partial fulfilment of the requirements for the degree of Master of Education.

D. Lorne R. Young
Supervisor

Clarence H. Pratt

L R Gue

Date 22 December 1977

ABSTRACT

The primary purpose of this study was to evaluate the industrial arts program in the government secondary schools in the Republic of Guyana. This particular research was attempted because no evaluative study had ever been conducted to determine the merits or problems of the program. Information was obtained, by questionnaires, from 17 of 31 government secondary schools that offered a program in industrial arts at the time of the study.

To achieve the primary purpose a modified version of Section 4-10, Industrial Arts of the Evaluative Criteria 4th Edition published by the National Study of Secondary School Evaluation was selected as the research instrument to collect data for the study. Permission to use this instrument was obtained from Dr. D.C. Manlove executive secretary of the National Study of Secondary School Evaluation. The areas included in the research instrument were: Organization; Nature of Offerings; Physical Facilities; Direction of Learning; Outcomes; and Special Characteristics of Industrial Arts.

The researcher travelled to the Republic of Guyana to conduct the study where the cooperation of the Ministry of Education (Guyana) was secured in all phases of the research. The study was national in scope and its population included the principal, the industrial arts department head/teacher, and a student representative

from among the senior students enrolled in the industrial arts program in each of the 31 participating secondary schools. These school personnel made up a Self-Evaluation Committee to appraise the industrial arts program in each school.

Analysis of the research instruments were made and the results and recommendations of the study were developed from the comments and responses submitted by participants. The results of the study showed that the industrial arts program in the 17 government secondary schools had major deficiencies in all six areas listed in the research instrument. Ten recommendations were offered to focus attention on the major problems identified as a result of the study.

ACKNOWLEDGEMENT

A study of this nature would not be possible without the assistance of many individuals. The author cannot begin to express his appreciation to them singularly and, therefore ask them collectively to accept his gratitude.

The writer is deeply indebted to Dr. D.R. Young, his thesis supervisor, for the encouragement, support, and direction he provided in completing this study; Dr. C.H. Preitz for his generous assistance and guidance during the preparation of this manuscript; and to Dr. L.R. Gue for the constructive criticisms and valuable suggestions which he contributed as a member of the thesis committee.

Special thanks are extented to the Government of Guyana, through the Public Service Ministry, Training Division, who made it possible for me to pursue studies at the University of Alberta.

Many thanks are also extended to Mr. B. Agard, Assistant Chief Education Officer, Secondary, of the Ministry of Education, and all personnel in the participating government secondary schools in Guyana without whose cooperation this study could not have been completed.

Finally, the author dedicates this thesis to his wife, Gloria, whose patience and understanding contributed immensely to his completing this manuscript.

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CHAPTER I

INTRODUCTION

Orientation to the Problem

The Republic of Guyana, formerly British Guiana is situated on the North-east of the continent of South America between Venezuela, Brazil, and Suriname. Figure 1 shows the geographical location of the Republic. Guyana has an area of 83,000 square miles with an estimated population of 794,348 (June, 1975). Population figures for the last census taken in April, 1970 show there were 347,852 males, 351,996 females for a total population of 699,848 (West Indian and Caribbean Year book 1976-77, p. 166).

Secondary education is available to students between the ages of 12 and 18 years, and can be obtained at either the Senior Department of the Primary School or at the general secondary school in Guyana. Forms one, two, and three (grades 7, 8, 9) are offered by the Senior Department of the Primary School, after students had spent seven years in this school. These primary schools cater to students whose age range is between 5 years 9 months and 14 years of age. (compulsory education according to law is between the ages of 5 years 9 months and 12 years of age).

General secondary schools are either privately owned or owned and controlled solely by the government. The latter schools are termed 'Government Secondary Schools'.

Taken From "Caribbean Who, What, Why", 1968-71.

Figure 1.
GEOGRAPHICAL LOCATION OF GUYANA

Both types of schools are funded by the central government, since all education is free.

In addition to the basic academic subjects, reading, writing, and arithmetic offered in the primary schools, a program which includes woodwork and technical drawing (drafting) is conducted in centres and departments which are part of the primary schools. The privately owned secondary schools do not have any program of any significance in woodwork or technical drawing. The government secondary schools offer a program that includes woodwork, technical drawing, metalwork, and ceramics. This program is referred to as 'Industrial Arts'. It should be mentioned that, historically, the first program offered to students to teach them about tools and materials was entitled 'Handicrafts'.

Statistics from the Ministry of Education for the school year ending 1972/73 indicate that there was a total of 373 primary schools and 31 government secondary schools with a total enrolment of 78,246 students. Of these students approximately 70%, notably boys, were attenting practical courses in the various industrial arts facilities available in these schools. Although industrial arts has been taught in Guyana for a number of years, a systematic evaluation of the industrial arts program of studies has never been completed.

STATEMENT OF THE PROBLEM

The specific problem of this study was to conduct an

evaluation of the government secondary schools that offer a program of studies in industrial arts. The sub-problems of the study were:

1. To what extent are industrial arts courses available to all students in the government secondary schools of Guyana?
2. What industrial arts objectives are emphasized in the industrial arts subject area in the government secondary schools of Guyana?
3. To what extent do the present industrial arts facilities satisfy the stated objectives for the industrial arts program in the government secondary schools?
4. What are the major problems that confront industrial arts teachers who teach in the government secondary schools?
5. What is the educational background of industrial arts teachers who have responsibility for teaching industrial arts courses in the government secondary schools?
6. To what extent are industrial arts teachers satisfied with the content of the industrial arts program that is offered in the government secondary schools?

OBJECTIVES OF THE STUDY

The specific objectives of this study were to evaluate the following areas of the industrial arts program in the government secondary schools of Guyana:

1. The Organization;
2. The Nature of Offerings;

3. The Physical Facilities;
4. The Direction of Learning, including:
   (a) Instructional staff;
   (b) Instructional activities;
   (c) Instructional materials;
   (d) Method of evaluation.
5. The Outcomes of Learning;
6. The Special Characteristics of Industrial Arts in these secondary schools.

DELIMITATIONS OF THE STUDY

The investigation had the following delimitations:

(1) The study was delimited to the industrial arts program in the 31 government secondary schools located throughout the country and that offered courses in industrial arts.

(2) The research was delimited to the accuracy of the responses provided by the Self-Evaluation Committee for Industrial Arts which was established in each participating government secondary school.

The Self-Evaluation Committee for Industrial Arts consisted of the principal of the school, the industrial arts department head/teacher, and a student representative. (See page 36 for selection criteria for student representative).

ASSUMPTIONS

The study had the following assumptions:-

1. That the industrial arts teachers were competent educators in their subject area.

2. That the members who comprised the Self-Evaluation Committee in each participating school would have little or no difficulty in completing the research instrument.

3. That the modified evaluation instrument selected was appropriate to evaluate the industrial arts program in the government secondary schools of Guyana.

4. That the participants understood the questions in the research instrument, and that they provided valid responses with reference to the industrial arts program offered in their particular school.

SIGNIFICANCE OF THE STUDY

During the latter part of the seventies, accountability has become an important concept in education, particularly in industrial arts education. Periodic and rigorous evaluation of all educational programs is necessary, if obsolete programs are to be identified, improved, or discontinued, thus insuring the maximum use of the financial resources that are allocated to education.

The results of this study should provide relevant data about the industrial arts program that is offered in the government secondary schools of Guyana. It is hoped that the results of this study might be made use by those in authority to improve, further plan, expand, and develop the program of industrial arts.

It is also hoped that the results of the study and its

findings will be of use to all industrial arts teachers in the Republic to make their teaching more effective, and the industrial arts program in their schools more meaningful to meet the needs of the students and the country.

DEFINITION OF TERMS

The following operational definitions apply to terms used throughout this study.

Primary School

A primary school is defined as an educational institution which is non-selective, tuition free, organized for, and charged with the responsibility of educating children between the ages of 5 years 9 months and 14 years.

The primary school for these age groups is compulsory by law and is divided into:-

(a) The Preparatory Division, 2 classes A and B. (grades 1 and 2)

(b) The Lower Division, 2 Classes, standards I and II (grades 3 and 4).

(c) The Middle Division, 2 Classes, standards III and IV (grades 5 and 6).

(d) The Senior or Secondary Department, 3 forms, Forms I, II and III (grades 7, 8, and 9) (Guyana, Ministry of Education, 1974, p. 43).

Government Secondary School

A review of government documents from the Ministry of Education, Guyana, indicated that there was no definition for the term 'Government Secondary School'. The following

definition was developed from a working knowledge of education in Guyana and extensive reading of literature on education in Guyana.

A government secondary school is an educational institution whose sole support is the central government. This school is organized for and charged with the responsibility of educating students between the ages of 12 and 18 years or from Forms 1 to 6 (grades 7-12). It is non compulsory, non fee paying and equips its graduates for careers in the public service, business, the professions, or further education including university entrance.

Industrial Arts

Industrial arts is defined as that part of the total program of education concerned with introducing students to technical education and vocational training by training them in basic skills and at the same time providing the necessary orientation to make them appreciate working with the hands (Guyana, Ministry of Education, 1974, p.82).

Program

Program is defined as an outline of the contemplated procedures, courses, and subjects offered by a school over a given period of time (Good, 1973, p. 446).

Industrial Arts Facilities

An industrial arts facility is defined as any room or building equipped for the purpose of industrial arts

education (Aird, 1972, p. 6).

Evaluation

For this study evaluation is defined as the deliberate act of gathering and processing information according to some rational plan, the purpose of which is to render at some point in time a judgement about the worth of that on which the information is gathered (Pyatte, 1970, p. 386).

COLLECTION OF DATA

Population

The population of this study included the 31 government secondary schools of Guyana that offered an industrial arts program of studies at the time the research was conducted. In each of these schools, a Self-Evaluation Committee was struck. The members of this committee included the school principal, the industrial arts department head/teacher and a student representative from those students who were enrolled in the industrial arts program of studies.

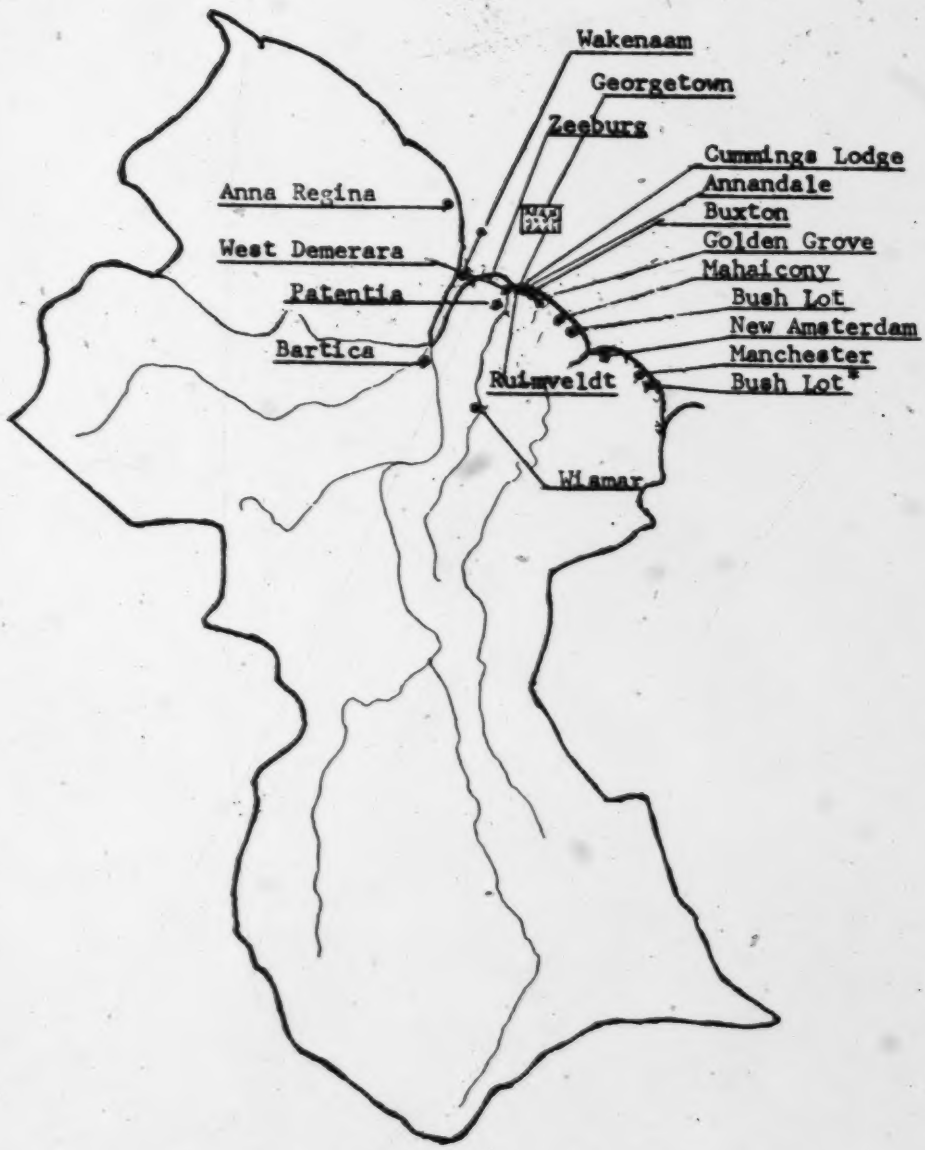
Figure 2 shows the geographical location of the participating government secondary schools.

Research Instrument

The instrument selected for the collection of pertinent data for this study was Section 4-10, Industrial Arts of the Evaluative Criteria, 4th Edition, published by the National Study of Secondary School Evaluation. Permission to use a modified version of Section 4-10 of the Evaluative Criteria,

FIGURE 2.

MAP OF GUYANA SHOWING LOCATION OF PARTICIPATING GOVERNMENT SECONDARY SCHOOLS



*This school was renamed Central Corentyne Government Secondary School.

4th Edition was received from the executive secretary of the National Study of Secondary School Evaluation, Dr. D.C. Manlove (Appendix A).

The reasons for selecting Section 4-10 as the research instrument for this study, as well as a description of the instrument and the manner in which it was modified are given in Chapter III.

Procedures

During February, 1977 the researcher wrote the Public Service Ministry (researcher's sponsor) notifying them of the topic of this investigation and requested permission to return to Guyana to administer the research instrument to personnel of the government secondary schools that offer a program of studies in industrial arts. Permission was granted and the researcher travelled to Guyana in May, 1977.

The Ministry of Education, through the office of the Assistant Chief Education Officer, Secondary, took the responsibility to mail the research instruments to the 31 government secondary schools that participated in the study. A covering letter was attached to each copy of the instrument. This letter introduced the researcher and requested that the completed research instruments be mailed to the office of the Assistant Chief Education Officer, Secondary, Ministry of Education.

Two weeks after the research instruments were mailed, the researcher made site visits to the 10 participating

secondary schools in the capital, Georgetown. Due to the scarcity of funds, the researcher was able to make site visits to only 15 of the 21 participating schools in the rural areas. During these visits the researcher, explained the purpose of the investigation to the principals and industrial arts department head/teacher, answered any questions they had concerning the establishment of the Self-Evaluation Committee and the selection of a student who would sit on this committee and represent the Industrial Arts students. The researcher requested a conducted tour of each industrial arts facility visited, and later solicited the cooperation of those involved in assessing industrial arts to complete and return the research instrument.

Three weeks after the completion of site visits the Assistant Chief Education Officer received only five completed questionnaires. A follow-up letter was prepared and sent to delinquent participants, reminding them to return their completed research instruments. The follow-up procedure yielded an additional 12 instruments. Of the 31 government secondary schools that offer a program in industrial arts 17 or 54.8% returned completed instruments.

Appendix C. page 217 includes the government secondary schools that participated in the study; those schools that were visited; and those schools that returned a completed research instrument.

DATA ANALYSIS

Because of the small number of research instruments

returned, 17 of 31 or 54.8%, data from these instruments were analysed by hand. Responses were tabulated and were presented as frequency tables. Percentages are used to illustrate the number of participants who responded to each statement on the research instrument.

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CHAPTER II

BACKGROUND OF THE STUDY

In the previous chapter, an orientation to the study and a brief description of the methodology used to bring the investigation to a successful conclusion were presented.

This chapter provides the background of the study through a review of the literature and related research.

AN HISTORICAL OVERVIEW OF EDUCATION IN GUYANA

The history of education in the Republic of Guyana, a former British Colony maybe divided into the following three periods:

1. 1823-1889 The Period of Amelioration Proposals and the Negro Education Grant.
2. 1890-1953 The Period of Dissatisfaction and Change.
3. 1954-1977 The Present Period.

1823-1889 The Amelioration Proposals and the Negro Education Grant

Education in British Guiana, like all other English speaking colonies of the Caribbean had its first official beginning with the passing of the British Government's Amelioration Proposals in 1823. Gordon, (1963) wrote that this proposal included, "religious instruction for slaves and were only enforced in those crown colonies where there was no planter dominated assembly with a right to reject them" (p. 12).

Popular or mass education, however, did not become a reality in the colony until the passing of the Emancipation Act. Cameron (1968) in commenting on the Emancipation Act, wrote the following:

> For Freedom in any of its various forms to thrive it must be based on and be nutured by knowledge and discipline. It was realized that, for the Emancipation Act to succeed, education must be widespread (p. 18).

The Emancipation Act included, among other things, a grant of money by the British Government to promote negro education. Gordon wrote that " in fact the total sum provided was £30,000 per annum for five years until it ended in 1845" (p. 19).

After Emancipation, education became such a popular commodity among the ex-slaves that the limited funds of the Negro Education Grant were not adequate to those who wanted to be educated. Before 1845, the expiry date of this Grant, the much needed finances for education were donated by the missionary bodies, by the local legislative assembly, and by some of the planters. According to the Latrobe Commission that investigated the system of education in both British Guiana and Trinidad in 1838, **no other British Colony in that part of the world had the legislative so fully and so unhesitantly met the views and wishes of the British Government by readily voting public funds for negro education.**

This approval of the Legislative Assembly manifested itself in a comparatively large number of schools being

opened by the various religious bodies. However, in 1850, there occured a bitter argument between the Legislative Assembly and the clergy concerning the nature and control of education. A Commission on Education appointed in 1850 by the Governor of the Colony, recommended a secular educational system. This recommendation received the support of the Combined Court which was a representative body comprised mainly of planters. The religious bodies petitioned against the decision of the Combined Court. In 1855 an Education Ordinance enacted by the Legislative Assembly reversed this policy in favour of the system of grants to maintain denominational schools.

According to Germanacos, Wander, and Congreve (1963) the denominational schools under the sponsorship and management of the clergy led to wholesale transference of the English educational system and its content to British Guiana. This was done with no attempt to adapt the English System of Education to either its new environment or to its new receivers. Germanacos et. al, noted that:

> The well intentioned clergy could hardly be expected to believe that what was good enough for the British working-class was not good enough or appropriate for the Guianese (p. 15).

During the eighteen-nineties and the first quarter of the twentieth century this misconception of the clergy led to extensive criticism of their education policy by both local and regional interest groups.

1890-1953 Period of Dissatisfaction and Change

By 1890 education in British Guiana had long ceased to be the mere learning to read and write or for that matter, being versed in the three R's. Secondary education was available on a limited extent to a few gifted children of ex-slaves, with the appointment of local teachers a fact. Also, in evidence were the products of the education system for the past sixty years. According to Gordon and other West Indian historians many students were leaving school with their memories well stocked with fundamental knowledge, but these students were doomed to a life of unemployment and crime, owing to the absence of any fixed systems of apprenticeship, training schools, or factories in the colony. An excerpt from an article in a daily newspaper from the capital, Georgetown during these times, would give an indication of the mood of the inhabitants.

Daily Chronicle, 7 March 1890.

> What we want in this colony are men who have received a scientific education: Engineers, chemists, mineralogists, electricians, men who will be able to bring every resource of science to bear in developing the country.
> At present the majority of these have to be imported at high salaries. The young creole is no worse for being able to construe a little Livy or Horace; but if the time for teaching him the resources of his own colony has been occupied in cramming his unwilling mind with Latin grammar,

> then it is not much to say that his education has been on wrong lines (p. 3).

The British Government saw agricultural training in schools as the best means of appeasing the many critics of the educational system. This scheme while being noteworthy soon drew the ire of the creoles who were vocal, because the British Government soon interpreted the employment problem in the colonies as a matter of finding agricultural employment for everyone. According to Gordon, Cameron and other West Indian historians agriculture remained an unprofitable employment for most people, since there was not sufficient land to support the growing population even as small land holders. An excerpt from an article in the Daily Chronicle would show how much was thought of the agricultural training plan:

> Daily Chronicle, 29 August 1919.
>
> Agricultural training in the schools is undoubtedly a farce for the simple reason that there is nothing for them to follow up when they leave school. How it can possible be expected that a love for the soil will be fostered in children who after they leave school are absolutely divorced from any means whereby they can pursue the bent given them is a little problem the feasibility of which is only apparent to the Administration (p. 4).

According to Gordon the decision by the administration to make all creoles farmers without land caused much

indignation, because it was evident that there was a growing interest among Guianese in other forms of employment, and training. Some of the directors of education saw this point and encouraged trade and craft instruction where these forms of instruction could be afforded. Blair, in a paper "Industrial Education in British Guiana", presented in Barbados in 1900, mentioned that the Nuns of the Ursuline Convent were the first to ask for a grant to establish a school laundry which became a success. Blair, in his paper also mentioned the tailorshop that was started in a school in Georgetown, and a carpentry shop in a school in one of the rural areas. Unfortunately, the carpentry shop was not successful and was soon abandoned.

Of all the criticisms of the educational system in British Guiana, the most influential and far reaching, in terms of tne resultant change that took place was in 1924 under the direction of Major W. Bain Gray, Ph.D, Director of Education. Many Guianese and West Indian historians have agreed that Major Gray's departmental report on the work of the Education Department for 1924 was one of the most forthright criticisms of a system of education ever to be issued in the British Caribbean.

Among other factors, Major Gray spoke out against the practice of employing untrained and underpaid teachers. As far as Major Gray was concerned this was, "the most dangerous aspect of the education system" (Gordon, 1964 p. 3). Major Gray claimed that the inadequacies of the schools and their

curricula were a consequence which was largely due to the inadequacies of the teachers. Major Gray also bemoaned the fact that there were no forms of practical or pre-vocational training. The absence of a training college for teachers Major Gray claimed was one aspect of the total neglect of technical or professional training in the colony. The full text of Major Gray's views on the absence of facilities for technical or professional training were as follows:

> In education beyond the primary stage there is a great lack of facilities for technical education of every kind. There is hardly any calling - agricultural, industrial or commercial - of which even the rudiments can be satisfactorily learnt in the colony. In the teaching profession, this lack of training institute has led to the multiplication of inferior practitioners, which is most dangerous to the efficiency of any art or craft; the same result is noticeable in skilled manual occupations throughout the colony (Gordon 1964, p.36).

The sentiments of Major Gray have been echoed and re-echoed by the local critics of the educational system with little or no effect for two decades, which caused the Director to obtain widespread public support for his findings. No one denies that between 1925 and 1953 British Guiana received a boost in its educational system. In 1928 the Government Training College for teachers was opened. Publicity campaigns were started to improve school attendance. Practical training centres were opened for older students and

the Carnegie Trade Centre for Women was started in 1933. An equivalent trade centre for boys and men was also opened in the same year. This latter trade centre was claimed to have alleviated the chronic unemployment problem in Guiana during the nineteen thirties.

1954-1977 The Present Period

Norman Cameron, writing about the education system in British Guiana after 1953 intimated that the creation of the Ministry of Education was a definite step in organizing the educational system. Cameron (1968) commenting on the role of the new Ministry wrote:

> The whole field of education must be regarded as an entity over which a watchful paternal eye must be kept. Projects approved must be carried out and not shelved. Enthusiasm may have to be controlled in favour of other more urgent needs (p. 71).

Cameron remarked that the White Paper of 1957 prepared by the new Ministry of Education showed evidence of planning for expansion, and the raising of the standard of education in the colony. The White Paper advocated the creation of secondary education centres in the different parts of the country having special regard to the distribution of schools and school inspection.

During 1968 education underwent a more drastic change with the completion and introduction of a second White Paper on Educational Policy. The opening pages of this document set the theme of the paper and is the key to the educational

philosophy of the government:

> The aim of the Government's educational policy is to produce, in the shortest time possible, Guyanese with adequate skills to meet our needs and, at the same time to broaden the scope and to change the content of the curriculum to provide for total development of each child.
>
> .....
>
> If Guyanese are to develop a national pride and a national outlook, our educational system must provide real equality of opportunity in all fields of endeavour in the country, and so remove all barriers to progress of the individual citizens, irrespective of ethnic origin, social background, religious convictions or political persausion (Guyana Government, 1968, p. 4).

Curriculum reform was one of the major innovations mentioned in this White Paper, for the government saw this as an imperative for the Guyanese to achieve their national goals. The full text of the opening paragraph of the section on curriculum reform follows:

> To meet the present needs of the country for technically trained personnel, the secondary school curriculum with the traditional emphasis on the academic arts subjects, even for children who have little or no interest in them, will be replaced by a curriculum in which adequate provision will be made for teaching the practical, technical, and science subjects to school

certificate or an equivalent level.

.....

The system of secondary education most favoured for the full development of the potential of the Guyanese child is of the comprehensive or multilateral type.

.....

Government proposes to begin immediately on the gradual transition from the traditional grammar school to the multilateral sic comprehensive type secondary school. In addition, the educational expansion programme will embody the establishment of new secondary schools to meet the needs of the environment.

(N.B. these latter secondary schools have since been named the Community High School) (Guyana Government p. 8).

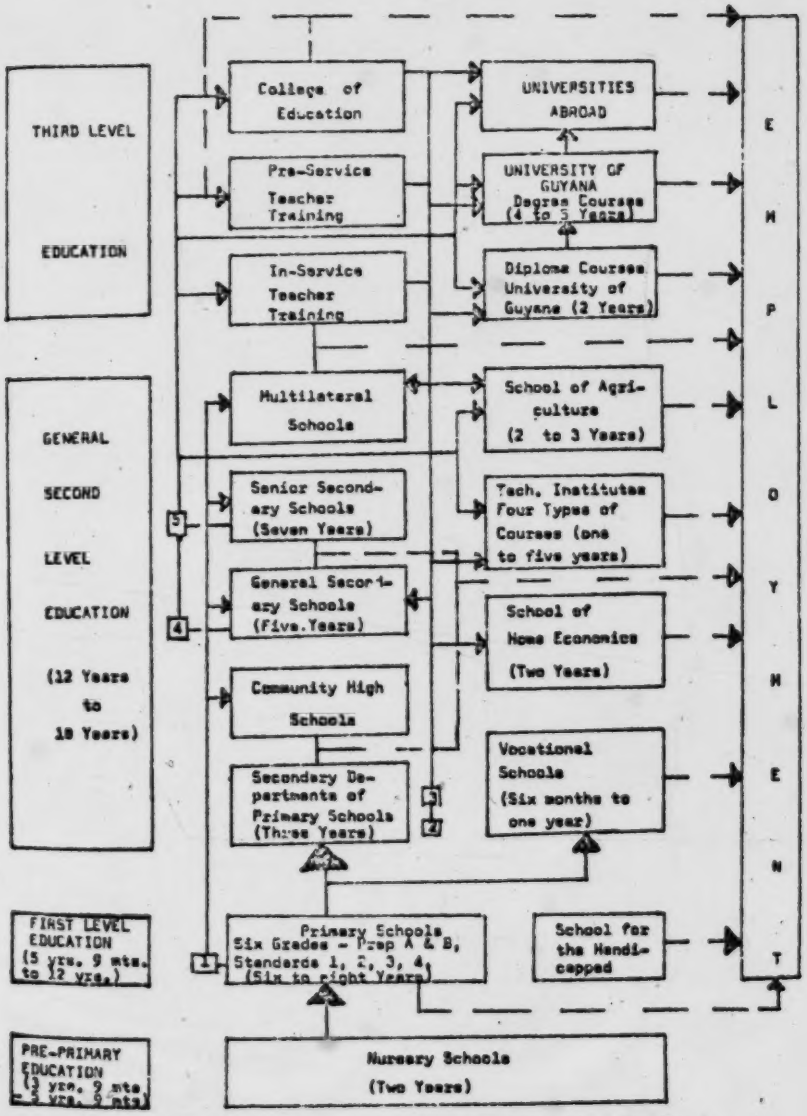
Figure 3 shows the educational system of Guyana which has evolved from the White Paper of 1968. On this chart can be seen the various levels of education in the Republic, the age group and number of years for each, together with the various examinations to be passed in each level. Examinations numbers, 3, 4 and 5 are presently being administered by London University in Great Britain. It should be mentioned that moves are being made to replace these three examinations of London University by examinations developed by a Caribbean Board of Examiners.

A DESCRIPTION OF THE INDUSTRIAL ARTS PROGRAM IN GUYANA

The following description of the industrial arts program

FIGURE 3

EDUCATIONAL SYSTEM OF GUYANA


THIRD LEVEL EDUCATION
GENERAL SECOND LEVEL EDUCATION (12 Years to 18 Years)
FIRST LEVEL EDUCATION (5 yrs. 9 mts. to 12 yrs.)
PRE-PRIMARY EDUCATION (3 yrs. 9 mts - 5 yrs. 9 mts)
College of Education
Pre-Service Teacher Training
In-Service Teacher Training
Multilateral Schools
Senior Secondary Schools (Seven Years)
General Secondary Schools (Five Years)
Community High Schools
Secondary Departments of Primary Schools (Three Years)
Primary Schools Six Grades - Prep A & B, Standards 1, 2, 3, 4 (Six to eight Years)
Nursery Schools (Two Years)
UNIVERSITIES ABROAD
UNIVERSITY OF GUYANA Degree Courses (4 to 5 Years)
Diploma Courses University of Guyana (2 Years)
School of Agriculture (2 to 3 Years)
Tech. Institutes Four Types of Courses (one to five years)
School of Home Economics (Two Years)
Vocational Schools (Six months to one year)
School for the Handicapped
EMPLOYMENT
1
2
3
4
5

EXAMINATIONS:

1. Secondary Schools Entrance Examination
2. Preliminary Certificate Examination
3. College of Preceptors Examination
4. General Certificate of Education, Ordinary Level
5. General Certificate of Education, Advanced Level.

Guyana - Ministry of Education, 1976.

in the secondary schools in Guyana was formalized by the researcher after a careful scrutiny of the government's publications on education, especially those pertaining to industrial arts education and vocational education.

Philosophy of the Industrial Arts Program

The philosophy as perceived by the researcher of the industrial arts program in Guyana is to develop the individual growth of the student by exposing him to acceptable personal and social values necessary in an emerging productive society, through positive attitudes towards:

(a) safety,
(b) consumer value,
(c) dignity of work,
(d) good work habits, and
(e) vocational interests and skills.

Functions of the Industrial Arts Program

1. To provide a setting in which the adolescent is understood and one in which he might experience success which contributes to a positive concept of self and others.

2. To continue the development in the basic skills and knowledge begun in the primary school and to broaden the educational program to include more opportunity for students to think critically and to draw generalizations.

3. To provide a breadth of curricular offerings suited to the interest and needs of 12-18 year old youths and to permit wherever feasible, student selection of educational experience.

4. To provide mental, physical, and aesthetic needs of the students and to develop talents in these areas.

5. To provide opportunities within the curriculum and extra-curricularly for the development of acceptable social, moral, and spiritual values.

6. To help youths discover special interests and abilities that will enable them to set realistic educational and vocational goals.

General Objectives of Industrial Arts Program

Objectives of the Basic Course years 1-3

1. To develop in each student an insight and understanding of industry and its place in our society.
2. To discover and develop talents of students in the technical field and applied sciences.
3. To develop technical problem - solving skills related to materials and processes.
4. To develop in each student a measure of skills in the use of common tools and machines (Guyana, Ministry of Education, 1977, p. 2).

Objectives from third year on

1. To teach students correct and accepted trade skills demanded by industry in their specific areas.
2. To prepare students with the correct work attitude to help them embrace the job marked with confidence.
3. To identify areas and develop the necessary skills for self-employment.
4. To make students aware of the careers open to them in

their field of work.

5. To help them organize themselves in the field of industry as a cooperative venture.
6. To guide more able students on to further/higher education in technical education (Ministry of Education p. 3).

Clients of Industrial Arts Program

Boys and Girls

Age range: 12-18

Grade levels: 7-12

Length of Industrial Arts Program

Minimum of 3 academic years with a maximum of 5 years.

Funding Basis of Industrial Arts Program

Tuition is free and all funds provided by the Central Government.

Funds are provided for program on two levels:

(i) as part of the total school budget

(ii) according to the number of students enrolled in program.

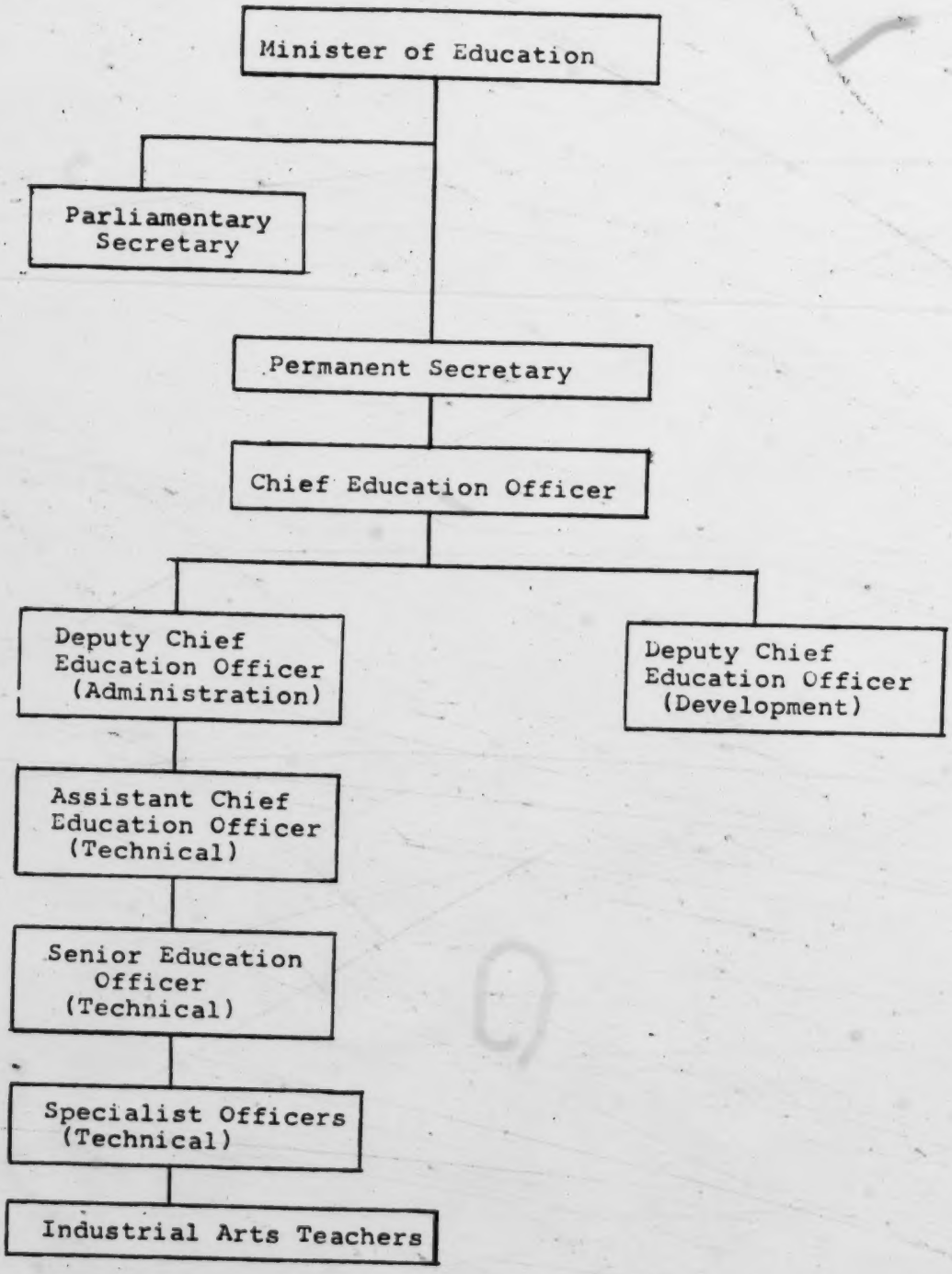
Administrative Structure of Industrial Arts

Figure 4 shows a section of the organizational chart of the Ministry of Education illustrating the administrative structure of industrial arts education.

Staff Qualifications for Industrial Arts

Minimum of two years teacher's training in industrial arts or any related field from the following institutions:

FIGURE 4



A section of the Organizational Chart of the Ministry of Education Showing Administrative Structure of Industrial Arts Education in Guyana (Ministry of Education, 1976, p.15).

(i) College of Education for Secondary Teachers.

(ii) Government Training College for Primary Teachers.

(iii) The University of Guyana.

(iv) The Government Technical Institutes.

Learning Experiences in Industrial Arts

Field trips, work experience, laboratory, lectures, and individualized instruction.

Inputs of Industrial Arts Program

Students: All students are required to enroll in the industrial arts (or home economics) program during their first year in the secondary school. This requirement must be met even if students did not take part in industrial arts or home economics activities in the primary schools.

Materials: (expendable) Consumable materials are in the form of stationery, lumber, sheet metal, paints, drafting tape and the like - all provided by the central government.

Equipment: (Capital) Previously, most of the equipment needed in these industrial arts facilities were of the hand tools nature. As of 1974, machines such as wood and metal lathes, circular saws, bench saws, drill presses together with oxyacetylene welding equipment were installed in most of the industrial arts departments.

REVIEW OF LITERATURE

Evaluative studies in Industrial Arts Education.

Evaluation Models in Education:

(i) The general and the specific models.

(ii) Models in industrial-vocational education.

Evaluative Studies in Industrial Arts

In order to establish a theoretical framework for this study, a library research of the standard indexes for reporting the findings of educational research was undertaken to determine if any studies dealing with the evaluation of industrial arts program had been completed. This research revealed that a number of evaluative studies similar to this one had been completed and have implications for this particular study.

Stangl (1968) in his study, "The Development of Evaluative Criteria for Secondary Industrial Arts and its Application To Selected Schools", developed evaluative criteria for evaluating the secondary schools industrial arts program in New Mexico. Stangl used as the main topics for his evaluative criteria, curriculum, physical facilities, and teacher preparation. The criteria statements were rated by secondary school principals and industrial arts teachers in New Mexico and were tested in selected secondary schools of Colorado. Stangl concluded:

> Some periodic means of examining secondary industrial arts was needed to inform teachers, administrators, and state educational officials of the inadequacies which may exist in their school programs and the appropriate steps which might be required to eliminate such difficulties (p. 170).

In accordance with his findings, Stangl recommended

that a national industrial arts group should assume the responsibility to determine the feasibility for evaluating secondary industrial arts program on a national basis.

Wright (1970) in his study, "An Evaluative Study of Industrial Arts Graphics in the Junior High School of Alberta", found that student achievement was low, and the desired outcomes were not at a level acceptable to either a standards committee or the industrial arts instructor. The specific weaknesses in the planned curriculum for industrial arts in Alberta that this study revealed were:

1. The intent of the curriculum planners as stated in the curriculum guide was subject to misinterpretation by industrial arts teachers, especially with regard to essential distinctions, the emphasis to be given various activities, and the orientation of the study.
2. The concepts listed in the curriculum guide are not sufficiently clear to enable the industrial arts teacher to direct his students to a full understanding of the Graphic activities.
3. The curriculum guide failed to outline specific teaching procedures which the judges felt necessary to ensure the desired level of student achievement.
4. Because of low performance and participation levels as well as a lack of time, the concepts presented in the guide are unrealistically difficult.
5. The validity of present methods of measuring students' understanding of the various concepts listed in the curriculum guide must be questioned (pp. 39-40).

Vilaiprom's (1971) study, "An Evaluation of the Industrial Arts Program in the Thirteen Comprehensive Schools in Thailand" and Aird's (1972) study, "An Evaluation of the Industrial Arts Program in the Primary Schools of Grenada" have a definite relationship to this study.

To collect data for his study, Vilaiprom used a modified version of section D-11, Industrial Arts, of the Evaluative Criteria, 1960 Edition, published by the National Study of Secondary School Evaluation.

The findings of the study by Vilaiprom which was conducted in Thailand are summarized below:

1. The members of the evaluating committees were generally satisfied with the organization of the industrial arts programs.
2. That the stated objectives of the industrial arts program were being met in the nature of offerings, with eleven of the seventeen items presented, rated above average or excellent.
3. Deficiencies in physical facilities were found in three broad areas:
   (i) the physical layout of the shop.
   (ii) the utilities provided in the shop, and
   (iii) the equipment provided in the shop.
4. In the direction of learning, the industrial arts program was not meeting its stated objectives as measured by the evaluative instrument:
   (a) Although seven of the twelve statements

listed for evaluating instructional staff were rated above average or excellent, several deficiencies were found in this area.

(b) Instructional activities were found to be deficient in two broad general areas of class activities and supporting instructional hardware.

(c) Industrial arts teachers in most of the comprehensive schools were found to be seriously in need of all types of instructional materials.

(d) Seven of the thirteen evaluating committees questioned the validity and reliability of the present method of student evaluation. These committees felt that instruments were needed to enable industrial arts teachers to evaluate leadership development, responsibility, problem solving ability, and attitudes towards safety.

5. In the area of outcomes it was found that students were not acquiring the ability to select, care for and use industrial products intelligently or to appreciate good design and construction. Evaluators felt it to be a serious shortcoming of their programs that students did not develop an understanding of the properties and uses of raw materials used in their shop (pp. 128-136).

Aird conducted an Evaluation of the Industrial Arts Program offered in the Primary Schools of Grenada. To collect data for his study, Aird also used a modified version of Section D-11, Industrial Arts, of the Evaluative Criteria, 1960 Edition. The findings of this study are summarized below:

1. The organization of industrial arts in Grenada was considered satisfactory by the participants, but the major concern of eleven of the twelve participants was financial support for the program.
2. The stated objectives of the industrial arts program were being met in the nature of offerings, with fourteen of the seventeen items presented rated as satisfactory.
3. Physical Facilities. Though forty of the items in the checklist dealing with physical facilities were considered inapplicable, twenty-four of the remaining thirty-five items were rated as unsatisfactory.
4. In the area of Direction of Learning:
   (a) Instructional staff as evaluated by the participants was generally satisfactory.
   (b) Instructional activities were also rated as satisfactory.
   (c) Instructional materials as measured by the evaluative instrument were generally unsatisfactory.

   Only three of the ten items dealing with instructional material were rated as

satisfactory by the participants.

(d) Methods of evaluation were also rated as satisfactory by participants.

5. In the area of outcomes, four of the ten items in the General Evaluation of the Outcomes of Industrial Arts were rated as Satisfactory. Two items were inconclusive. It was not possible, therefore, to draw any conclusion concerning the outcomes of industrial arts as measured by the evaluative instrument (pp. 89-92).

The literature has shown that in the two countries the industrial arts programs needed improvement in several areas. A summary of the areas that need improvement are: the number and duration of class periods; physical facilities; instructional materials; and in some cases the general direction of industrial arts.

In one respect, these studies were limited, because there was no student participation. As the products of any instructional program, students have as much to contribute in any evaluative procedure as instructors, administrators, and lay individuals. To negate this criticism, this study included a student representative in each of the Self-Evaluation Committees established in each of the participating schools.

The following criteria were established by the researcher for selecting the student representative to serve on these evaluation committees: These criteria were:

(a) The student must have been involved in the

industrial arts program for no less than three years.

(b) The student should have obtained an average mark of 60 or greater in industrial arts at the previous annual examination.

(c) This student should be involved in the industrial arts program at the time of the investigation.

Evaluation Models in Education

The General and the Specific Model

Evaluation models were first conceptualized and used by the military; later by government, business, and industry; and during the last two decades by educational institutions. Various models for the evaluation of the many aspects of education have since been developed. According to Wenig (1969) six of the best known developers of education evaluation models are:

(1) Alkin (1969) with his Evaluation Theory Model.

(2) Provus (1968) with his Discrepancy Evaluation Model.

(3) Scriven (1967) with his Methodology of Evaluation Model.

(4) Stake (1967) with his Countenance of Educational Evaluation Model.

(5) Stufflebeam (1968) with his Context, Input, Process and Product Evaluation Model.

and (6) Hammond (1968) with the EPIC Evaluation Model (p. 50).

During the latter part of the seventies, these models have all been severly critized by educationists, owing to their (models) general nature. Among the most vocal is Borich (1974) who in describing the models of Stake, Stufflebeam, among others, stated that these models by nature of their generalizability while being helpful to an evaluator in establishing a general perspective towards his task, often yielded special problems in later stages of the evaluation.

The full text of Borich statement is:

1. The general evaluation model does not cover in sufficient detail specific dimensions relevant to a particular context. (Because these models must be applicable to a variety of settings, they do not focus on the unique characteristics of any setting).
2. The general model lacks specification of strategies, that is, how to describe, monitor, examine, and analyze when these activities are suggested by the general model. (While such terms are commonplace in descriptions of general models, it is the overall perspective that is important rather than the methodology of specific activities posed by the models. Therefore, one is left to find other guides for methods of implementing the general model).
3. The general evaluation model being applicable to so many different contexts that claims for its success usually vary considerably. (Because such models are purported to be applicable to a health education

> product as to a physics curriculum, for example, the contexts in which these models are applied are often not considered as integral components to their success or failure) (p. 146).

Borich et. al, while encouraging the development of specific education evaluation models pointed out that owing to the construction and utilization of the many different kinds of education evaluation models, developers should attempt to interrelate concepts either specific or general that run across the different models in use. Borich et. al, also noted that the field of educational evaluation had been increasingly complicated in the past years by the growth and development of the many evaluation models. According to these educationists, some of these models might only confuse evaluators by suggesting different approaches and by using diverse terminologies purported to be applicable to the same kinds of problems.

Borich et. al, remarked that:

> While the evaluator can, of course, choose only one model or a combination of models, it is important to the development of evaluation that concepts in one model be related to concepts in others (p. 196).

Worthen and Sanders (1973) in an introduction to the writings of Cronbach, Scriven, Stake, Stufflebeam, Alkin, Hammond and Provus also recommended:

> We suggest that the would be evaluator be eclectic, whenever possible, in selecting useful concepts from

each of the following papers and combining them into an evaluation plan that is better for having incorporated the best features of several approaches (p. 41).

Pyatte (1970) reminded evaluators that while the education evaluation model provides the mind with a very useful tool, it was not, however, without its limitation and its encumbrances. Pyatte saw one of the limitation as arising from the fact that exact correspondence between a model and the situation in reality which the model supposedly explained was difficult to achieve. This author remarked "an ideal model is almost never achieved, and if a model is believed to be good, it is often difficult to prove its worth" (p. 306).

Models in Industrial - Vocational Education

A thorough examination of the various specific models, developed and used to evaluate industrial-vocational education, revealed that they were all made up of concepts introduced by one or more of Wenig's six well known developers of education evaluation models. Of the many writers in industrial-vocational education, the models of The American Industry Project; Welty (1970); and Sjogren (1970) were selected for elaboration in this review. These models were chosen owing to their emphasis upon techniques and their direct relevance to the development of a model for this study.

Evaluation Model of the American Industry Project

The American Industry Project is an industrial arts program designed for secondary schools to help students "develop a knowledge of the interrelationships that exist among the concepts in the Project's conceptual structure of industry". (Nelson, 1969, p. 44) The evaluation model of the American Industry Project consists of three domains - the 'ingredients', 'processes', and 'products' - in which to collect data.

According to Nelson, research specialist of this project, the evaluation system of the American Industry Project was developed to assess the outcomes of the study of a new curriculum and to provide management information to the Project Staff. Nelson explains the domains as follows:

Ingredients Domain: encompasses all the inputs into the learning situation. Examples of these inputs are the quality of the instructional materials, ability and interest of the students, characteristics of the participating teachers, and the intellectual climate of the school and community.

Processes Domain: As the course is being taught a number of instructional processes are applied to and interact with these inputs. Students are exposed to instructional media, activity sheets, and booklets in the American Industry course.

Product Doamin: Product or outcomes is concerned with

> the nature of the student at the end of the course and in future years, impressions of the teachers, reaction by administrator and Staff members at the school, and opinions of the parents (p. 40).

Evaluation Model of Welty

Welty (1970) in his article 'A Plan for Educational Evaluation' asserted that one of the reasons for the shortcomings of the traditional approach to educational evaluation was that "the traditional approach had denied the professionalism of the teacher" (p. 5). Welty strongly believed that the teacher by virtue of his training and experience should be able to contribute to a program in both its development and evaluation.

In explaining his 'social psychological change model' Welty remarked that the first requirement of the evaluation effort was a program design or blueprint. This design or blueprint was necessary so that "out of the congerie of conceptions of what a vocational education program should be, one unique blueprint must emerge" (p. 5). To achieve this unique blueprint, Welty deemed it necessary to assemble representatives of the various interest groups, namely, teachers, administrators and ask them to express themselves about their conception of the program.

Welty's 'social psychological change model' is comprised of three domains - 'Inputs', 'Process', and 'Outputs'. A further description of Welty's model is

given below:

Inputs:

Variables: Student measures; staff measures.

Preconditions: Student conditions; staff qualification; administrative support; media; facilities; time.

Criteria: For each Input variable and Precondition above.

Process:

Variables: Student activities; staff activities, function and duties; communication.

Criteria or Range: One for each of the Process variables.

Outputs:

Variables: Same as Input variables.

Precondition: Same throughout treatment by definition.

Criteria: These define the goals of the program in terms of the variables (p. 7).

Evaluation Model of Sjogren

Sjogren (1970) suggested that evaluation of educational programs should focus on larger number of educational phenomena rather than simply evaluate the attainment of objectives. Sjogren developed a model to evaluate industrial-vocational educational programs with three domains - 'Inputs or Antecedents', 'Processes or Transactions', and 'Outputs or Outcomes'. In commenting on these three domains, Sjogren wrote:

> The implementation of an input - process - outcome evaluation plan raises important measurement problems.

> The inclusion of the many variables in a comprehensive evaluation requires a massive amount of measurement and classification. There are also problems associated with obtaining valid and reliable measurement and classification of a great many variables, including many not traditionally considered in evaluation methodology (p. 301).

Sjogren recommended the following criteria for the measurement of the three domains:

Measurement of Inputs or Antecedents

Variables: The characteristic of students; the characteristics of staff; budgetary constraints; physical facilities constraints.

Measurement of Processes or Transactions

Variables: Instructional materials; educational environment.

Measurement of Outputs or Outcomes

Variables: (i) Objectives of program.

(ii) (a) What benefits accrue to both the individual and society from the program?

(b) What are the investment returns and the consumption returns of the program?

(c) What are the non-economic benefits such as being better citizens, better consumer of arts as a result of program?

(d) What are the trade-offs, that is, what did the person not learn by being in this program instead of another?

(iii) Employability of graduates of the program.

(iv) Contribution of the graduate to the economic growth, production of goods and needed services (p. 307).

Summary

A review of the literature on evaluation models in education has shown that though the general evaluation models of Stake, Stufflebeam, among others, are of considerable importance to education, the use of specific evaluation models has proliferated in order to circumvent the several disadvantages that are now being recognized in these general models. Most educationists feel that the specific evaluation model should be developed to cater for the unique circumstances of one's situation.

However, these educationists also cautioned about the use of diverse terminology, and recommended that in constructing new models, one should try to interrelate concepts either specific or general that run across the different models already in use.

The evaluation models used by the American Industry Project, Welty, and Sjogren showed that the developers of these models were consistent in their terminology. Of the three models mentioned, the model of Welty and Sjogren provided most of the concepts for the design section of the evaluation model developed for this study.

DEVELOPMENT OF EVALUATION MODEL TO EVALUATE THE INDUSTRIAL ARTS PROGRAM OF GUYANA

The evaluation model (Figure 5) is a combination and modification of both Welty and Sjogren models together with information from section 4-10 Industrial Arts, of the Evaluative Criteria, Fourth Edition, published by the National Study of Secondary School Evaluation.

Explanation of Model

Figure 5, Evaluation Model, shows the procedures that were followed in the total evaluation of the industrial arts program in the government secondary schools of Guyana. In the first column of "Identify and describe program to be evaluated", a brief description of the program was given. The "Rationale" or reasons for conducting the evaluation were:

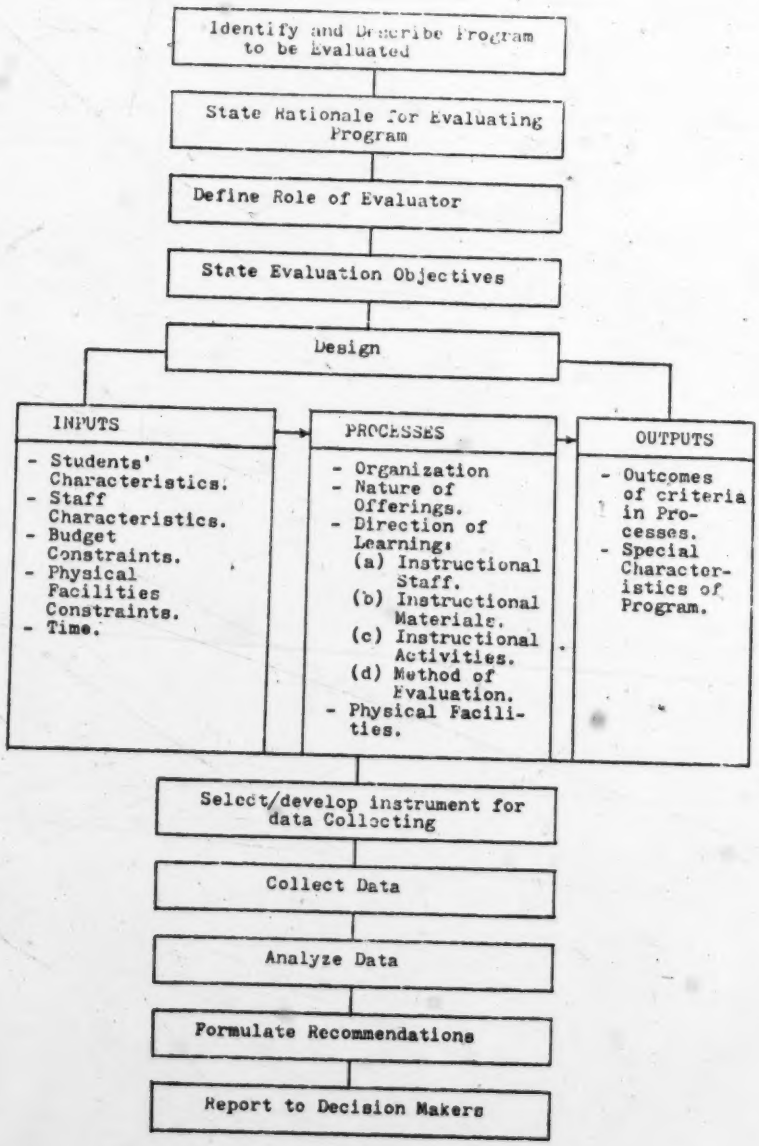
(a) The industrial arts program in Guyana had never been evaluated before, thus, the merits or problems of the program had never been determined in any systematic way.

(b) By having the principal, industrial arts teachers, and a student in each participating school complete the criteria statements in the evaluative process, it was hoped that these school personnel would be motivated, and thus attempt periodic evaluations of their industrial arts program.

The "Role of the Evaluator" in this study was one of a staff member who recognised certain deficiencies in the

FIGURE 5.

Evaluation Model



(Developed from: Welty (1970); Sjogren (1970); and the National Study of School Evaluation (1969)).

industrial arts program, and hence, attempted to quantify these deficiencies, so that the researcher would be in a position to make recommendations for their improvement.

The "Objectives" of the evaluation were to evaluate the following areas of the industrial arts program:

1. The Organization;
2. The Nature of Offerings;
3. Physical Facilities;
4. The Direction of Learning;
5. The Outcomes of Learning;
6. The Special Characteristics of Industrial Arts Program in the government secondary school.

Most important to the Model for evaluating the industrial arts program of studies in the government secondary schools of Guyana was the design phase which was divided into "Inputs", "Processes", and "Outputs".

Inputs: For this study the inputs of the program consisted of all the factors that were stipulated by the Ministry of Education (Guyana) for the day to day functioning of the industrial arts program. Examples are the entry level of students into the programs; the stipulated qualification of teachers, the amount of cash to be expended on both teachers' salaries and physical facilities, and the number of class periods for the program.

Processes: Most of the evaluation was on how the industrial arts program was actually being implemented in

the secondary schools. Therefore, the organization of the program, the objectives or nature of offerings, and the direction of learning as exemplified by instructional staff, instructional activities, instructional materials, and the method of evaluation were closely examined.
Physical facilities were also examined to find out whether the objectives of the program corresponded with the type of facilities in these schools.

Outcomes: In this section it was hoped that a look at the "Inputs" and "Processes" (as they were) would determine whether the program was fulfilling the needs for which it was developed. Also, the special characteristics of these programs could be determined by the "Inputs" and "Processes" section.

Select/Develop Instrument for Data Collection: After a review of the pertinent literature on evaluative studies and evaluation models in industrial arts, the researcher selected the industrial arts section of the Evaluative Criteria, Fourth Edition, published by the National Study of Secondary School Evaluation as the instrument to collect data for the study.

Collect Data: To collect data for the study, a copy of the evaluative instrument was mailed to the principals of the 31 participating government secondary schools that offered a program of studies in industrial arts.

Analyze Data: In analyzing the collected data, responses were tabulated into frequency of responses and were converted

to percentages to determine the percentage of participants who responded to a particular statement.

Formulate Recommendations: Recommendations were formulated from the research data and were made to the decision makers in the Ministry of Education.

The last phase: "Report to Decision Makers" showed that this step was in keeping with the defined role of the reseacher. Hence, any decision concerning the program would be made by those officers in the Ministry of Education in authority to do so.

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CHAPTER III

METHODOLOGY

The previous chapter gave the background of the study. This chapter presents the methodology used to conduct the study and collect pertinent data for analysis.

CRITERIA USED TO SELECT PARTICIPATING SCHOOLS

All government secondary schools in Guyana that met the following criteria were selected for participation in this study:

1. Each participating government secondary school had to have industrial arts facilities as defined in Chapter I (p. 8).
2. Each participating government secondary school had to satisfy the definition of a government secondary school as defined in Chapter I (p. 7).
3. The industrial arts facilities of each participating school had to be in use for instruction in industrial arts at the time of the study.

POPULATION

The population for this study as previously discussed in Chapter I (p. 9) included the 31 government secondary schools in Guyana that offered an industrial arts program of studies at the time the research was conducted. In each of these schools, a Self-Evaluation Committee was struck. The members of this committee included the school principal, the industrial department head/teacher and a student representative from those students who were enrolled in the industrial

arts program. Criteria for selecting this student representative are given in Chapter II (p. 36).

RESEARCH INSTRUMENT

A modification of section 4-10, Industrial Arts, of the Evaluative Criteria, 4th Edition, published by the National Study of Secondary School Evaluation was used as the research instrument for this study. Slight changes were made to adapt this particular research instrument to the Guyanese setting. The changes were: Item statements were rewritten into questions. The researcher felt that in rating questions, the participants would be less tempted to use such words as 'yes' or 'no' instead of the criteria for judgement in the research instrument. The rating ND - "Missing But Needed" was added to help participants with the overall evaluation of the industrial arts program. All words, phrases, and sentences that pertained to the United States were also changed to reflect a Guyanese context.

Major components and subcomponents of the research instrument included:

1. Organization	15 item statements
Evaluations	3 item statements
2. Nature of Offerings	17 item statements
Evaluations	6 item statements
3. Physical Facilities	40 item statements
Evaluations	6 item statements
4. Direction of Learning	

A. Instructional Staff	17 item statements
(a) Evaluations	5 item statements
B. Instructional Activities	20 item statements
(b) Evaluations	5 item statements
C. Instructional Materials	8 item statements
(c) Evaluations	3 item statements
D. Method of Evaluation	15 item statements
(d) Evaluations	4 item statements
5. Outcomes	13 item statements
6. Special Characteristics of Industrial Arts	3 item statements

The manner in which the participating Self-Evaluation Committees rated each item statement in each of the six areas of the research instrument will be presented in Chapter IV of this report.

In addition to the items provided in each area of the research instrument, space was provided for the Self-Evaluation Committees to make comments on their industrial arts program. Comments are also included in this report and can be found in the various sections where the data are presented.

Reliability

Since its first publication in 1940, the Evaluative Criteria of the National Study of Secondary School Evaluation had been extensively used by individuals in both the United States of America and other parts of the world to evaluate educational programs. Concomitant with its extensive usage,

the Evaluative Criteria was revised several times. In discussing these revisions in the fourth edition, the authors of the Evaluative Criteria reported:

> As was done during the periods of 1940-48 and 1950-58, the Study made extensive effort from 1960 to 1968 to obtain criticisms and suggestions from users of the materials. In addition to the suggestions returned in writing, the Director of Revision visited general meetings and workshops of the accrediting associations and also individual schools in order to discuss problems, sensitive areas and suggestions (p. 5).

The developers of the Evaluative Criteria also reported that altogether several hundred people from coast to coast and from north to south of the United States contributed to the revision and helped to develop "an up-to-date, improved instrument" (p. 5).

Validity

The validity of the Evaluative Criteria 4th Edition rests on the fact that all the significant changes made in the Criteria since its first publication were those changes supported either "by research or suggestions from experienced observers and informed specialists in the various fields" (p. 5). The provisions for users of the research instrument to insert additional items and to eliminate irrelevant ones to suit the needs of any particular school situation serves to extend the validity of the instrument for evaluating the industrial arts program

in the government secondary schools of Guyana.

Self-Evaluation, as promulgated by the authors of the Evaluative Criteria, as a technique in survey research, is recognized by educationists as a valid method of identifying clues of an entire system of education, in order to provide school personnel and educational authorities in studying their on-going programs with the view to improving them.

USE OF RESEARCH INSTRUMENT

Each part of the research instrument consists of items which are found in an effective industrial arts program. From these items it was possible for the Self-Evaluation Committees set up in each participating school to make a judgment and rate the industrial arts program in their school in relation to the philosophy and objectives of that school, and the needs of the students. The instructions provided with each copy of the research instrument requested that participants should appoint a chairman from among the members of the Self-Evaluation Committee who would be responsible for the completion of the research instrument. In rating the industrial arts program, the chairman was instructed to encircle the number corresponding to their (committee's) judgement on each item on a four point scale. Four representing the Upper Extreme of the continuum - Excellent, and one representing the opposite or Lower Extreme - Poor, with two and three representing Fair and Good respectively.

If the provision was not found to exist in an industrial arts program, but was believed to be Needed, the committees were instructed to encircle the ND - "Missing But Needed" rating. On the other hand if the provision was neither applicable nor desirable the committees were instructed to encircle the NA - "Neither Applicable Nor Desirable rating".

Each part of the research instrument was provided with a space for the Self-Evaluation Committees' comments directed at the deficiencies of the industrial arts program, and how these deficiencies might be modified or improved, so that the program could better meet its established objectives.

COLLECTION OF DATA

To collect data for this study, the researcher travelled to the Republic of Guyana in May, 1977 where the cooperation of the Ministry of Education was secured in all phases of the research. (See chapter I, p. 11 for more details).

DATA ANALYSIS

Data from the 17 instruments collected were analysed by hand. Responses were tabulated according to the frequencies with a percentage given for each frequency.

Chapter Reference

National Study of Secondary School Evaluation, Evaluative Criteria 4th Edition. Washington: National Study of Secondary School Evaluation, 1969.

CHAPTER IV

ANALYSIS OF THE DATA

The methodology used to collect the pertinent data for this study was presented in Chapter III. These data are analysed and presented in this Chapter.

PRESENTATION OF DATA

The reader will recall that the research instrument for this study consisted of the following six sections: Organization, Nature of Offerings, Physical Facilities, Direction of Learning, Outcomes, and Special Characteristics of Industrial Arts. The 4 point scale and 2 categories used by the Self-Evaluation Committees to record their responses to the various item statements of the research instrument were:

4	EXCELLENT
3	GOOD
2	FAIR
1	POOR
ND	MISSING BUT NEEDED
NA	NEITHER APPLICABLE NOR DESIRABLE

The analysed data for each section of the research instrument were tabulated using the following method. Item statements that were rated on the 4 point scale were placed into one of two major categories either <u>High</u> or <u>Low</u>. (Mattel and Jacoby (1971) among others, found that the conversion of multi-stepped scales to dichotomous or trichotomous measures did not significantly reduce either reliability or

validity). Statements rated 4(excellent) or 3(good) were placed in the High category. Statements rated 2(fair) or 1(poor) were placed in the Low category.

For this study, it was decided that if 51% or more of the Self-Evaluation Committees rated an item statement as High (excellent or good), the members favourably accepted the item statement. Similarly, if 49% or more of the Self-Evaluation Committees rated an item statement, Low, (fair to poor) the members considered the item undesirable and modification or improvement in that part of the industrial arts program would have to be made. The two additional categories ND - "Missing But Needed" and NA - "Neither Applicable Nor Desirable" would be classified in a similar manner to those statements rated as Low.

With reference to specific items of the research instrument, the letter or number of the item would be given first, followed by a percentage enclosed in parenthesis, for example, 10(58.8%), which represents the total percent of Self-Evaluation Committees rating an item statement. Percentages in each of the tables are presented in rank order.

ORGANIZATION OF INDUSTRIAL ARTS

Table 1, Organization of Industrial Arts, presents the frequency of the responses and a percentage for each of the 15 items in the checklist that deal with the organization of industrial arts in the 17 participating schools. These data

Table 1

Frequency and Percentage of Self-Evaluation Committees on the Organization of Industrial Arts

N=17

Item Statement	Frequency of Responses of Committees						No Response	Percent of Self-evaluation Committees Rating statements					
	Favourable		Undesirable					High		Low		Missing But Needed	Neither Applicable Nor Desirable
	4	3	2	1	ND	NA		4	3	2	1	ND	NA
10. Do staff members cooperate with the public relations efforts of the school?	2	8	4	1	2	0		10/17 (58.8%)		5/17 (29.4%)		2/17 (11.8%)	
13. Are occupational information and guidance an integral part of the program?	3	7	4	1	2	0		10/17 (58.8%)		5/17 (29.4%)		2/17 (11.8%)	
1. Is the program of industrial arts education available to all students?	2	7	1	1	5	1		9/17 (52.9%)		2/17 (11.8%)		5/17 (29.4%)	1/17 (5.9%)

Table 1 (Continued)

Item Statement	Frequency of Responses of Committees							Percent of Self-evaluation Committees Rating statements					
	Favourable		Undesirable				No Response	High		Low		Missing But Needed	Neither Applicable Nor Desirable
	4	3	2	1	ND	NA		4	3	2	1	ND	NA
2. Are specific industrial arts objectives or goals identified with each course offering?	3	6	5	0	3	0		9/17 (52.9%)		5/17 (29.4%)		3/17 (17.6%)	
3. Is the industrial arts program so organized that it can be adjusted to the demands of new situation?	2	7	4	2	1	0	1	9/17 (52.9%)		6/17 (35.3%)		1/17 (5.9%)	
9. Is the industrial arts program coordinated with other courses?	2	6	2	2	5	0		8/17 (47.1%)		4/17 (23.5%)		5/17 (29.4%)	

Table 1: Organization of Industrial Arts (Continued)

Item Statement	Frequency of Responses of Committees						No Response	Percent of Self-evaluation Committees Rating statements					
	Favourable		Undesirable					High		Low		Missing But Needed	Neither Applicable Nor Desirable
	4	3	2	1	ND	NA		4	3	2	1	ND	NA
15. Do teachers of the same grade level plan together to develop the industrial arts program at that level?	4	4	0	1	7	1		8/17 (47.1%)		1/17 (5.9%)		7/17 (41.2%)	1/17 (5.9%)
5. Are class periods of sufficient length to produce progress in learning?	1	6	4	5	1	0		7/17 (41.2%)		9/17 (52.9%)		1/17 (5.9%)	
8. Is program development a co-operative endeavor involving administrators, supervisors, teachers, and lay people. Do teachers and students work together in planning on the classroom level?	0	6	3	1	6	1		6/17 (35.3%)		4/17 (23.5%)		6/17 (35.3%)	1/17 (5.9%)

Table 1 (Continued)

Item Statement	Frequency of Responses of Committees							Percent of Self-evaluation Committees Rating statements					
	Favourable		Undesirable				No Response	High		Low		Missing But Needed	Neither Applicable Nor Desirable
	4	3	2	1	ND	NA		4	3	2	1	ND	NA
11. Are repair and production jobs permitted in the industrial arts program only if they are desirable educational experiences for students?	1	5	4	0	3	3		6/17 (35.3%)		4/17 (23.5%)	3/17 (17.6%)		3/17 (17.6%)
14. Do teachers of the various grade levels plan together to develop a sequential program in industrial arts?	3	3	1	1	6	2	1	6/17 (35.3%)		2/17 (11.8%)	6/17 (35.3%)		2/17 (11.8%)
12. Is a daily nonteaching, conference period, free from regularly assigned duties, provided for each teacher carrying a full schedule of classes?	1	4	4	0	7	1		5/17 (29.4%)		4/17 (23.5%)	7/17 (41.2%)		1/17 (5.9%)

Table 1: Organization of Industrial Arts (Continued)

Item Statement	Frequency of Responses of Committees						No Response	Percent of Self-evaluation Committees Rating statements					
	Favourable		Undesirable					High		Low		Missing But Needed	Neither Applicable Nor Desirable
	4	3	2	1	ND	NA		4	3	2	1	ND	NA
4. Are Industrial arts facilities available to students, under proper supervision, outside regular class time?	1	1	3	2	7	3			2/17 (11.8%)	5/17 (29.4%)		7/17 (41.2%)	3/17 (17.6%)
6. Is the class size determined by such factors as type of activity, available space and safety of students?	0	2	0	8	4	2	1		2/17 (11.8%)	8/17 (47.1%)		4/17 (23.5%)	2/17 (11.8%)
7. Does the school budget provide adequate funds to support all elements of the industrial arts program?	0	1	3	4	7	1	1		1/17 (5.9%)	7/17 (41.2%)		7/17 (41.2%)	1/17 (5.9%)

indicate that of the 15 items in the checklist, five were rated as High (excellent or good) by 51% or more of those who were involved in the study, and one item was rated as Low, (fair to poor) by 49% of these participants. The five items that were rated as High, in rank order were: 10(58.8%), 13(58.8%), 1(52.9%), 2(52.9%), and 3(52.9%). It would appear that the content of each of these statements was favourable to the members of the Self-Evaluation Committees.

The item statement 5 was rated as Low by 52.9% of the Self-Evaluation Committees. From an analysis of this item, it would appear that the participants were less than satisfied with the length of class periods in the various subject areas of the industrial arts program. The remaining nine items and the percentage of Self-Evaluation Committees rating each of them as High in rank order, were 9(47.1%) 15(47.1%), 8(35.3%), 11(35.3%), 14(35.3%), 12(29.4%), 4(11.8%), 6(11.8%), and 7(5.9%).

Though the percentage of the Self-Evaluation Committees rating each of the remaining nine items did not satisfy the criteria for a decision - either favourable or undesirable - to be recorded concerning these statements, some of the committees, anyhow, showed marked dissatisfaction for a number of these statements. Items 6 and 7 each being rated Low by 47.1% and 41.2% of the participants, respectively showed these Self-Evaluation Committees were not too happy with the size of their classes, and the budget provided for industrial arts in their respective schools. Items 15, 12,

and 4, each rated ND - Missing But Needed by 41.2% of the participants showed that the members of these Self-Evaluation Committees would welcome: more scope for teachers of the same grade level to plan their industrial arts program together; more non-teaching, conference periods; and more scope for students to use the industrial arts facilities outside of regular class time.

Table 2 Evaluations of Organization, presents the frequency of the responses and a percentage for each of the three items that deal with the evaluations of organization of industrial arts in the 17 participating schools. These data indicate that two of the items were rated as Low (fair to poor) and the third item rated midway between the categories High and Low respectively.

The two items that were rated as Low were: c(76.5%), and b(52.9%). An analysis of these items revealed that participants were less than satisfied with the appropriateness of schedules, time allotments, class sizes, and financial support for industrial arts.

Table 3 presents the frequency and a percentage for each of the subject areas in industrial arts that are being taught in the government secondary schools of Guyana. These data indicate that of the 17 Self-Evaluation Committees, 12 committees provided information for this section of 'Organization' entitled 'Supplementary Data'. These data show that there are eight subject areas in industrial arts currently being taught in the government secondary schools.

Table 2

Frequency and Percentage of Self-Evaluation Committees on the Evaluations of Organization

N=17

Item Statement	Frequency of Responses of Committees							Percent of Self-evaluation Committees Rating statements					
	Favourable		Undesirable				No Response	High		Low		Missing But Needed	Neither Applicable Nor Desirable
	4	3	2	1	ND	NA		4	3	2	1	ND	NA
a) To what extent are industrial arts courses available to all students?	2	5	4	4	1	0	1	7/17 (41.2%)		8/17 (47.1%)		1/17 (5.9%)	
b) How appropriate are schedules, time allotments, and class sizes for industrial arts course offerings?	1	4	7	2	2	1	.	5/17 (29.4%)		9/17 (52.9%)		2/17 (11.8%)	1/17 (5.9%)
c) How adequate is financial support for the industrial arts program?	0	2	8	5	2	0		2/17 (11.8%)		13/17 (76.5%)		2/17 (11.8%)	

Table 3

Frequency and Percentage of Industrial Arts Subject areas taught in the Government Secondary Schools

N = 12

Subject Areas	Frequency*	Percentage
Technical Drawing	12	100%
Woodwork	8	66.7%
Metalwork	5	41.7%
Electricity	2	16.7%
Ceramics	2	16.7%
Plastics	1	8.3%
Leathercraft	1	8.3%
Plumbing	1	8.3%

*Frequency indicates the number of schools offering each subject area.

These subject areas are: Technical Drawing which is being taught in all of the schools; Woodwork taught in 67.7% of the schools; Metalwork taught in 41.7% of the schools; Electricity taught in 16.7% of the schools; Ceramics in 16.7%, and Plastics, Plumbing, Leathercraft, each being taught in only one or 8.3% of the government secondary schools.

Comments

Eleven of the 17 Self-Evaluation Committees provided comments on the Organization of Industrial Arts. Their comments can be summarized as follows:

1. Four committees stated that the space allocated for industrial arts was inadequate, given the number of students who attended classes at any one time.

2. Three committees mentioned that the grant provided for industrial arts was too small, and hence, the industrial arts program was affected by the lack of many needed materials and equipment.

3. Two committees mentioned that time was always insufficient to conduct a good lesson. One of these committees pointed out that this problem was encountered because the "academic" subjects were given priority when the timetable of the school was being drawn up.

4. One committee stated that the industrial arts program should be expanded to include other subject areas, such as, metalwork, electricity, and building construction.

NATURE OF OFFERINGS

Table 4 Nature of Offerings presents the frequency of

Table 4

Frequency and Percentage of Self-Evaluation Committees on the Nature of Offerings of Industrial Arts

N=17

Item Statement	Frequency of Responses of Committees							Percent of Self-evaluation Committees Rating statements					
	Favourable		Undesirable				No Response	High		Low		Missing But Needed	Neither Applicable Nor Desirable
	4	3	2	1	ND	NA		4	3	2	1	ND	NA
15. Are student-centered activities emphasized in teaching-learning process?	2	12	3	0	0	0		14/17 (82.4%)		3/17 (17.6%)			
13. Is emphasis placed on a continuous and coordinated departmental program of safety?	4	9	1	1	1	0	1	13/17 (76.5%)		2/17 (11.8%)		1/17 (5.9%)	

Table 4 (Continued)

Item Statement	Frequency of Responses of Committees						No Response	Percent of Self-evaluation Committees Rating statements					
	Favourable		Undesirable					High		Low		Missing But Needed	Neither Applicable Nor Desirable
	4	3	2	1	ND	NA		4	3	2	1	ND	NA
8. Is emphasis placed on the development of better understanding of such problems as appropriateness of material to use, quality of workmanship, design, and function?	5	7	5	0	0	0		12/17 (70.6%)		5/17 (29.4%)			
7. Are specific efforts directed toward the development of a working knowledge of industrial materials and processes?	4	7	4	1	1	0		11/17 (64.7%)		5/17 (29.4%)	1/17 (5.9%)		

Table 4: Nature of Offerings (Continued)

Item Statement	Frequency of Responses of Committees						No Response	Percent of Self-evaluation Committees Rating statements					
	Favourable		Undesirable					High		Low		Missing But Needed	Neither Applicable Nor Desirable
	4	3	2	1	ND	NA		4	3	2	1	ND	NA
4. Has the part that industry played in the development of the Guyanese way of life emphasized in each course area?	1	9	2	0	4	0	1	10/17 (58.8%)		2/17 (11.8%)	4/17 (23.5%)		
5. Are basic skills and concepts applied to the solution of technical problems?	3	7	5	1	1	0		10/17 (58.8%)		6/17 (35.3%)	1/17 (5.9%)		
6. Are specific efforts in the program directed towards the development in each individual, an attitude of pride and interest in doing useful things?	3	7	5	1	1	0		10/17 (58.8%)		6/17 (35.3%)	1/17 (5.9%)		

Table 4 (Continued)

Item Statement	Frequency of Responses of Committees						No Response	Percent of Self-evaluation Committees Rating statements					
	Favourable		Undesirable					High		Low		Missing But Needed	Neither Applicable Nor Desirable
	4	3	2	1	ND	NA		4	3	2	1	ND	NA
11. Is emphasis placed on developing an ability to select, care for, and use industrial products intelligently?	3	7	4	1	1	1		10/17 (58.8%)		5/17 (29.4%)	1/17 (5.9%)	1/17 (5.9%)	
1. Do the courses provided opportunities for youth to plan, construct, and evaluate projects suitable to their interests and aptitudes?	3	6	1	2	5	0		9/17 (52.9%)		3/17 (17.6%)	5/17 (29.4%)		
9. Are specific efforts made to develop an awareness of the variety of activities performed in our industrial environment that provide possibilities for leisure-time activities?	2	7	2	2	4	0		9/17 (52.9%)		4/17 (23.5%)	4/17 (23.5%)		

Table 4: Nature of Offerings (Continued)

Item Statement	Frequency of Responses of Committees						No Response	Percent of Self-evaluation Committees Rating statements					
	Favourable		Undesirable					High		Low		Missing But Needed	Neither Applicable Nor Desirable
	4	3	2	1	ND	NA		4	3	2	1	ND	NA
12. Are basic skills, such as reading, writing, arithmetic, speaking, and listening continually emphasized and made a part of the instructional program?	5	4	4	0	3	1		9/17 (52.9%)		4/17 (23.5%)		3/17 (17.6%)	1/17 (5.9%)
2. Are experiences provided in selected areas so that a degree of skill in the use of common tools and machines may be developed commensurate with the student's ability and the scope of the program?	1	7	5	1	3	0		8/17 (47.1%)		6/17 (35.3%)		3/17 (17.6%)	

Table 4 (Continued)

Item Statement	Frequency of Responses of Committees						No Response	Percent of Self-evaluation Committees Rating statements					
	Favourable		Undesirable					High		Low		Missing But Needed	Neither Applicable Nor Desirable
	4	3	2	1	ND	NA		4	3	2	1	ND	NA
16. Are experiences provided to acquaint the student with the world of work, including its changing nature, and to help develop a wholesome attitude toward work?	1	6	7	0	2	1		7/17 (41.2%)		7/17 (41.2%)		2/17 (11.8%)	1/17 (5.9%)
14. Are activities in the program organized to provide significant group activities and projects that involve situations that are likely to involve problems?	2	3	8	2	0	1		5/17 (29.4%)		10/17 (58.8%)			1/17 (5.9%)

Table 4: Nature of Offerings (Continued)

Item Statement	Frequency of Responses of Committees							Percent of Self-evaluation Committees Rating statements					
	Favourable		Undesirable				No Response	High		Low		Missing But Needed	Neither Applicable Nor Desirable
	4	3	2	1	ND	NA		4	3	2	1	ND	NA
10. Is an overview of working conditions and labor-management problems included in the instructional program?	0	3	5	1	6	2		3/17 (17.6%)		6/17 (35.3%)		6/17 (35.3%)	2/17 (11.8%)
17. Are students provided an opportunity for in-depth specialization in areas of their respective aptitude and interests?	1	2	4	1	8	1		3/17 (17.6%)		5/17 (29.4%)		8/17 (47.1%)	1/17 (5.9%)
3. Is braod content developed in each course in the program from representative industrial processes and materials appropriate for a school shop?	0	2	5	1	6	2	1	2/17 (11.8%)		6/17 (35.3%)		6/17 (35.3%)	2/17 (11.8%)

the responses and a percentage for each of the 15 items in the checklist that deal with the nature of offerings of industrial arts in the 17 participating schools. These data indicate that of the 17 items in the checklist, 11 items were rated as High, (excellent or good) by 51% or more of those who were involved in the study, and one item was rated as Low by 49% of these participants. The 11 items that were rated as High, in rank order, were: 15(82.4%), 13(76.5%), 8(70.6%), 7(64.7%), 4(58.8%), 5(58.8%), 6(58.8%), 11(58.8%), 1(52.9%), 9(52.9%), and 12(52.9%). It would appear that the content of each of these statements was favourable to the members of the Self-Evaluation Committees.

The item that was rated as Low by 49% or more of the participants was: 14(58.8%). An analysis of this statement showed that the members of these Self-Evaluation Committees were less than satisfied that the activities of their industrial arts program were organized to provide significant group activities and group projects that involved problem solving situations.

The remaining five items and the percentage of Self-Evaluation Committees rating each of them as High, in rank order, were: 2(47.1%), 16(41.2%), 10(17.6%), 17(17.6%), and 3(11.8%).

Table 5, Evaluations of Nature of Offerings, presents the frequency of the responses and a percentage for each of the six items that deal with the evaluations of nature of offerings of industrial arts in the 17 participating schools.

Table 5

Frequency and Percentage of Self-Evaluation Committees on the Evaluations of Nature of Offerings

N=17

Item Statement	Frequency of Responses of Committees						No Response	Percent of Self-evaluation Committees Rating statements					
	Favourable		Undesirable					High		Low		Missing But Needed	Neither Applicable Nor Desirable
	4	3	2	1	ND	NA		4	3	2	1	ND	NA
a) To what extent are the information and experiences offered in the program related to modern industry?	2	6	7	2	0	0		8/17 (47.1%)		9/17 (52.9%)			
e) To what extent is student responsibility and leadership developed?	0	8	8	1	0	0		8/17 (47.1%)		9/17 (52.9%)			

Table 5 (Continued)

Item Statement	Frequency of Responses of Committees							Percent of Self-evaluation Committees Rating statements					
	Favourable		Undesirable				No Response	High		Low		Missing But Needed	Neither Applicable Nor Desirable
	4	3	2	1	ND	NA		4	3	2	1	ND	NA
b) To what extent are scope and sequence of courses related to the interests, abilities, and developmental needs of students?	2	4	7	3	1	0	1	6/17 (35.3%)		10/17 (58.8%)			
f) To what extent is the program flexible to meet the needs of all students?	0	5	6	3	3	0		5/17 (29.4%)		9/17 (52.9%)		3/17 (17.6%)	
c) To what extent do the offerings provide exploratory or tryout experiences with a variety of tools, materials, and industrial processes?	1	3	8	3	2	0		4/17 (23.5%)		11/17 (64.7%)		2/17 (11.8%)	

Table 5: Evaluations of Nature of Offerings (Continued)

Item Statement	Frequency of Responses of Committees							Percent of Self-evaluation Committees Rating statements					
	Favourable		Undesirable				No Response	High		Low		Missing But Needed	Neither Applicable Nor Desirable
	4	3	2	1	ND	NA		4	3	2	1	ND	NA
d) To what extent do students understand labor-management problems?	0	3	6	4	3	1		3/17 (17.6%)		10/17 (58.8%)		3/17 (17.6%)	1/17 (5.9%)

These data indicate that all six items were rated as, Low, by 49% or more of the Self-Evaluation Committees. These six items were: c(64.7%), b(58.8%), d(58.8%), a(52.9%), e(52.9%), and f(52.9%). An analysis of these items showed that participants were less than satisfied that: the offerings of the industrial arts program provided exploratory or tryout experiences with a variety of tools, materials, and industrial processes; the scope and sequence of the industrial arts courses were related to the interest, abilities and developmental needs of the students; their industrial arts students understood labour-management problems; the information and experiences offered in the industrial arts program were related to modern industry; their industrial arts students developed attitudes of responsibility and leadership from the program; and, the industrial arts program was flexible enough to meet the needs of all students.

Comments

Seven of the 17 Self-Evaluation Committees provided comments on the Nature of Offerings of Industrial Arts. Their comments can be summarized as follows:

1. One committee stated that more planning should be done at the Industrial Arts section of the Ministry of Education, so that an up-to-date curriculum guide could be made available to all industrial arts teachers. This committee felt that such a move by the Ministry of Education would help individual staff members in planning a better program.

2. One committee stated that inadequate space, materials, and tools limit the nature of offerings in their school. This committee mentioned that they would greatly appreciate it, if the Guyana State Corporations (companies owned by the Guyana Government) could make more information available on careers and processes in their respective companies.

3. One committee stated that only hand tools were available in their shop. This committee mentioned that students were only given a working knowledge of industrial materials and processes as they relate to the wood industry.

4. One committee mentioned that students who had successfully completed their training in industrial arts should be in touch with guidance personnel who might be able to help them in a choice of a technical career or further training.

5. One committee stated that the boys in their school did not have any interest in industrial arts because of the following:

(a) Preference to "white collar" jobs.

(b) The lack of relevant technical and career information to motivate students.

(c) The poor condition of the industrial arts shop.

6. One committee mentioned that the time alloted for industrial arts, and the fact that the school was geared at providing students to write external examinations did not allow the industrial arts program to be geared to the needs of the students.

7. One committee mentioned that though the school was geared to prepare students for (1) Technical Drawing and (2) Design and Technology at the General Certificate of Education examination, (G.C.E.), Ordinary level, of the London University, England, the materials and equipment in the various laboratories were very unsatisfactory. This committee stated that so far, no materials or equipment were available for metalwork.

PHYSICAL FACILITIES

Table 6, Physical Facilities, presents the frequency of the responses and a percentage for each of the 40 items in the checklist that deal with physical facilities of industrial arts in the 17 participating schools. These data indicate that of the 40 items in the checklist, five items were rated as High (excellent or good) by 51% or more of the participants, three items were rated as Low (fair to poor) and 10 items were rated as ND - Missing But Needed by 49% or more of the participants. The five items that were rated as High, in rank order, were: 35(94.1%), 32(70.6%), 14(64.7%), 38(64.7%), and 26(58.8%). It would appear that the content of each of these statements was favourable to the members of the Self-Evaluation Committees. The three items that were rated as Low, were: 27(70.6%), 39(58.8%), and 25(52.9%). An analysis of these three items showed that the participants were less than satisfied that: the quantity and variety of tools, instruments, and equipment provided for industrial arts, met the needs of the program;

Table 6

Frequency and Percentage of Self-Evaluation Committees on the Physical Facilities of Industrial Arts

N=17

Item Statement	Frequency of Responses of Committees						No Response	Percent of Self-evaluation Committees Rating statements					
	Favourable		Undesirable					High		Low		Missing But Needed	Neither Applicable Nor Desirable
	4	3	2	1	ND	NA		4	3	2	1	ND	NA
35. Are one or more well-located, permanent chalkboards, ample in size and in good condition, provided in each school shop or drawing room?	8	8	0	0	1	0		16/17 (94.1%)				1/17 (5.9%)	
32. To what extent do all tools and equipment used in school shops receive proper maintenance?	1	11	2	2	0	1		12/17 (70.6%)		4/17 (23.5%)			1/17 (5.9%)

Table 6 (Continued)

Item Statement	Frequency of Responses of Committees							Percent of Self-evaluation Committees Rating statements					
	Favourable		Undesirable				No Response	High		Low		Missing But Needed	Neither Applicable Nor Desirable
	4	3	2	1	ND	NA		4	3	2	1	ND	NA
14. Is a filing space located near the instructor's desk and is adequate for all necessary records, pamphlets, and illustrative materials?	0	11	0	4	1	1		11/17 (64.7%)		4/17 (23.5%)		1/17 (5.9%)	1/17 (5.9%)
38. Are Industrial arts shop clean and neat?	2	9	4	1	0	0	1	11/17 (64.7%)		5/17 (29.4%)			
26. Are tools and machines selected on the basis of their instructional value?	1	9	3	1	1	1	1	10/17 (58.8%)		4/17 (23.5%)		1/17 (5.9%)	1/17 (5.9%)

Table 6: Physical Facilities (Continued)

Item Statement	Frequency of Responses of Committees						No Response	Percent of Self-evaluation Committees Rating statements					
	Favourable		Undesirable					High		Low		Missing But Needed	Neither Applicable Nor Desirable
	4	3	2	1	ND	NA		4	3	2	1	ND	NA
3. Is natural light effectively controlled to eliminate glare. Is sufficient supplemental artificial light, properly diffused and distributed, provided. Is local lighting provided in critical work areas?	2	6	0	1	7	1		8/17 (47.1%)		1/17 (5.9%)		7/17 (41.2%)	1/17 (5.9%)
4. Are floors in good condition and are suited to the area in which they are located; are precautions taken against slippery floors, special attention being given to machine areas?	3	5	2	2	2	3		8/17 (47.1%)		4/17 (23.5%)		2/17 (11.8%)	3/17 (17.6%)

Table 6 (Continued)

Item Statement	Frequency of Responses of Committees						No Response	Percent of Self-evaluation Committees Rating statements					
	Favourable		Undesirable					High		Low		Missing But Needed	Neither Applicable Nor Desirable
	4	3	2	1	ND	NA		4	3	2	1	ND	NA
7. Do each school shop facility has a minimum of two entrance-exit doors that each measure 36 inches or more in width?	5	3	0	1	6	2		8/17 (47.1%)		1/17 (5.9%)		6/17 (35.3%)	2/17 (11.8%)
8. Is the ceiling height appropriate, i.e., between 12 feet and 14 feet in all school shops and drawing rooms; and where applicable, are ceiling constructed of a material having a high coefficient of sound absorption?	4	4	2	1	4	2		8/17 (47.1%)		3/17 (17.6%)		4/17 (23.5%)	2/17 (11.8%)

Table 6: Physical Facilities (Continued)

Item Statement	Frequency of Responses of Committees							Percent of Self-evaluation Committees Rating statements					
	Favourable		Undesirable				No Response	High		Low		Missing But Needed	Neither Applicable Nor Desirable
	4	3	2	1	ND	NA		4	3	2	1	ND	NA
40. Are custodial services sufficient?	0	8	1	2	0	5	1	8/17 (47.1%)		3/17 (17.6%)			5/17 (29.4%)
2. Is the total floor area consistent with accepted standards?	3	3	0	5	5	0	1	6/17 (35.3%)		5/17 (29.4%)		5/17 (29.4%)	
39. To what extent are good planning and organization in evidence?	0	6	9	1	1	0		6/17 (35.3%)		10/17 (58.8%)		1/17 (5.9%)	
13. Is Convenient office or desk space provided?	1	4	4	2	6	0		5/17 (29.4%)		6/17 (35.3%)		6/17 (35.3%)	

Table 6 (Continued)

Item Statement	Frequency of Responses of Committees							Percent of Self-evaluation Committees Rating statements					
	Favourable		Undesirable				No Response	High		Low		Missing But Needed	Neither Applicable Nor Desirable
	4	3	2	1	ND	NA		4	3	2	1	ND	NA
30. Are conveniently located and appropriately painted switches or control boxes provided on all power machines. Are these easily accessible from the position of the operator?	4	1	0	2	5	5		5/17 (29.4%)		2/17 (11.8%)		5/17 (29.4%)	5/17 (29.4%)
31. Is a master electrical panel conveniently located in each shop. Do all machines that are wired in with the building provided with disconnect switches and have controls providing undervoltage and overload protection. Are all machines grounded?	2	3	0	0	7	5		5/17 (29.4%)				7/17 (41.2%)	5/17 (29.4%)

Table 6: Physical Facilities (Continued)

Item Statement	Frequency of Responses of Committees							Percent of Self-evaluation Committees Rating statements					
	Favourable		Undesirable				No Response	High		Low		Missing But Needed	Neither Applicable Nor Desirable
	4	3	2	1	ND	NA		4	3	2	1	ND	NA
36. Are one or more well-located tackboards, ample in size and in good condition, provided in each shop?	2	3	0	0	11	1		5/17 (29.4%)				11/17 (64.7%)	1/17 (5.9%)
37. Are motion picture, film-strip, slide, and opaque projectors and screens available?	1	4	1	1	9	0	1	5/17 (29.4%)		2/17 (11.8%)		9/17 (52.9%)	
9. Is each shop equipped with appropriately located fire extinguishers of the correct type and size?	1	3	0	1	12	0		4/17 (23.5%)		1/17 (5.9%)		12/17 (70.6%)	

Table 6 (Continued)

Item Statement	Frequency of Responses of Committees						No Response	Percent of Self-evaluation Committees Rating statements					
	Favourable		Undesirable					High		Low		Missing But Needed	Neither Applicable Nor Desirable
	4	3	2	1	ND	NA		4	3	2	1	ND	NA
10. Are shop walls durable and easily cleaned from floor to top-of-door height. Are sound-absorbing materials used on upper walls surfaces wherever the amount of noise suggests special wall treatment?	0	4	3	1	7	2		4/17 (23.5%)		4/17 (23.5%)		7/17 (41.2%)	2/17 (11.8%)
17. Is safe storage provided for all supplies; do the storage area accommodate full-length stock and all materials?	1	3	4	1	8	0		4/17 (23.5%)		5/17 (29.4%)		8/17 (47.1%)	

Table 6: Physical Facilities (Continued)

Item Statement	Frequency of Responses of Committees						No Response	Percent of Self-evaluation Committees Rating statements					
	Favourable		Undesirable					High		Low		Missing But Needed	Neither Applicable Nor Desirable
	4	3	2	1	ND	NA		4	3	2	1	ND	NA
20. To what extent is the equipment arranged with reference to the sequence of operations and their relationship to other areas. Is adequate clearance as dictated by the function of the machine, provided around all equipment?	1	3	2	2	7	2		4/17 (23.5%)		4/17 (23.5%)		7/17 (41.2%)	2/17 (11.8%)
23. Are a demonstration and discussion area, with space for each student, provided in all shops?	1	3	2	2	8	1		4/17 (23.5%)		4/17 (23.5%)		8/17 (47.1%)	1/17 (5.9%)

Table 6 (Continued)

Item Statement	Frequency of Responses of Committees							Percent of Self-evaluation Committees Rating statements					
	Favourable		Undesirable				No Response	High		Low		Missing But Needed	Neither Applicable Nor Desirable
	4	3	2	1	ND	NA		4	3	2	1	ND	NA
28. Are unit-type machines with self-contained motors used throughout the program; is equipment adapted to the size and maturity of the students, i.e., height from the floor to the working surface of a machine, horsepower, speed, and capacity?	2	2	1	2	6	4				4/17 (23.5%)	3/17 (17.6%)	6/17 (35.3%)	4/17 (23.5%)
29. To what extent are all power machines and manually operated equipment provided with effective guards that are used by the operators at all times?	2	2	2	1	5	5				4/17 (23.5%)	3/17 (17.6%)	5/17 (29.4%)	5/17 (29.4%)

Table 6: Physical Facilities (Continued)

Item Statement	Frequency of Responses of Committees							Percent of Self-evaluation Committees Rating statements					
	Favourable		Undesirable				No Response	High		Low		Missing But Needed	Neither Applicable Nor Desirable
	4	3	2	1	ND	NA		4	3	2	1	ND	NA
1. Are facilities appropriately located as a unit for students as well as for adult evening classes?	1	2	1	2	8	3		3/17 (17.6%)		3/17 (17.6%)		8/17 (47.1%)	3/17 (17.6%)
15. Does the school shop contain a convenient and centrally located tool and supply center and, where applicable, an adequate number of well-laid-out tool panel areas for special tools?	0	3	1	0	10	3		3/17 (17.6%)		1/17 (5.9%)		10/17 (58.8%)	3/17 (17.6%)
21. Are work stations sufficient in number to provide flexibility?	1	2	4	4	1	4	1	3/17 (17.6%)		8/17 (47.1%)		1/17 (5.9%)	4/17 (23.5%)

Table 6 (Continued)

Item Statement	Frequency of Responses of Committees							Percent of Self-evaluation Committees Rating statements					
	Favourable		Undesirable				No Response	High		Low		Missing But Needed	Neither Applicable Nor Desirable
	4	3	2	1	ND	NA		4	3	2	1	ND	NA
27. To what extent do the quantity and variety of tools, instruments, and equipment provided meet the needs of the program?	1	2	7	5	1	0	1	3/17 (17.6%)		12/17 (70.6%)		1/17 (5.9%)	
18. Are adequate storage areas provided for student projects under construction as well as for articles in the assembling and finishing stages?	0	2	3	4	8	0		2/17 (11.8%)		7/17 (41.2%)		8/17 (47.1%)	
6. Where needed, are properly designed and located gas, water, electrical, and compressed air facilities provided?	0	1	0	0	10	6		1/17 (5.9%)				10/17 (58.8%)	6/17 (35.3%)

Table 6: Physical Facilities (Continued)

Item Statement	Frequency of Responses of Committees						No Response	Percent of Self-evaluation Committees Rating statements					
	Favourable		Undesirable					High		Low		Missing But Needed	Neither Applicable Nor Desirable
	4	3	2	1	ND	NA		4	3	2	1	ND	NA
11. Are washing facilities and drinking fountain of appropriate design and location provided?	0	1	3	1	12	0		1/17 (5.9%)		4/17 (23.5%)		12/17 (70.6%)	
19. Are lockers adequate in number and size and are they located so as to avoid crowding?	0	1	0	4	9	3		1/17 (5.9%)		4/17 (23.5%)		9/17 (52.9%)	3/17 (17.6%)

Table 6 (Continued)

Item Statement	Frequency of Responses of Committees							Percent of Self-evaluation Committees Rating statements					
	Favourable		Undesirable				No Response	High		Low		Missing But Needed	Neither Applicable Nor Desirable
	4	3	2	1	ND	NA		4	3	2	1	ND	NA
22. To what extent is a finishing area with the following characteristics provided in each shop where the facility is important: adequate in size, appropriately located, properly lighted and ventilated, easily supervised, and relatively free from dust?	0	1	0	3	9	3	1	1/17 (5.9%)		3/17 (17.6%)		9/17 (52.9%)	3/17 (17.6%)
25. Are the facilities provided for using instructional materials appropriate to their purpose and are they conveniently located?	0	1	3	6	6	0	1	1/17 (5.9%)		9/17 (52.9%)		6/17 (35.3%)	

Table 6: Physical Facilities (Continued)

Item Statement	Frequency of Responses of Committees							Percent of Self-evaluation Committees Rating statements					
	Favourable		Undesirable				No Response	High		Low		Missing But Needed	Neither Applicable Nor Desirable
	4	3	2	1	ND	NA		4	3	2	1	ND	NA
33. Are appropriately identified safety zones marked around machines and in areas where there are potential hazards?	0	1	2	3	5	5	1	1/17 (5.9%)		5/17 (29.4%)		5/17 (29.4%)	5/17 (29.4%)
34. Are safety clothing and protective devices worn?	0	1	3	3	4	6		1/17 (5.9%)		6/17 (35.3%)		4/17 (23.5%)	6/17 (35.3%)
5. Is exhaust ventilation equipment available in areas where excessive heat, fumes, gases, and dust are produced?	0	0	2	0	7	8				2/17 (11.8%)		7/17 (41.2%)	8/17 (47.1%)
12. Is a display case of a sufficient size, properly lighted and appropriately located, provided?	0	0	3	1	13	0				4/17 (23.5%)		13/17 (76.5%)	

Table 6 (Continued)

Item Statement	Frequency of Responses of Committees							Percent of Self-evaluation Committees Rating statements					
	Favourable		Undesirable				No Response	High		Low		Missing But Needed	Neither Applicable Nor Desirable
	4	3	2	1	ND	NA		4	3	2	1	ND	NA
16. Are the principles of "color dynamics", with moderation, followed throughout each of the shops and on equipment?	0	0	2	3	8	4					5/17 (29.4%)	8/17 (47.1%)	4/17 (23.5%)
24. Are the shop library and planning facilities located conveniently but away from major machine noises and dirty areas of the shop. Is adequate space provided for the storage of books, magazines, and folders?	0	0	1	2	11	2	1				3/17 (17.6%)	11/17 (64.7%)	2/17 (11.8%)

there was any evidence of good planning and organization in industrial arts; and, the facilities provided for using instructional materials were appropriate or conviently located.

The 10 items that were rated as ND - Missing But Needed by 49% or more of the participants, in rank order, were: 12(76.5%), 9(70.6%), 11(70.6%), 24(64.7%), 36(64.7%), 6(58.8%), 15(58.8%), 19(58.8%), 22(52.9%), and 37(52.9%). An analysis of these 10 items showed that the members of the Self-Evaluation Committees would welcome in their industrial arts shop: a display case of sufficient size; a fire extinguisher of correct size and type in each separate area of industrial arts; additional washing and drinking facilities; a library or planning section which could be located away from areas of noise and dirt; one or more tackboards of ample size provided for each separate area of industrial arts; properly designed and located gas, water, electrical, and compressed air facilities in each separate area of shop where these facilities were needed; a centrally located tool and supply centre; students' lockers of adequate number and size properly located in the shop; a finishing area, well ventilated, properly lighted and located in an area of shop relatively free from dust; and, the availability of motion picture, film strips, slides, or opaque projectors, and screens to aid in their teaching of industrial arts.

The remaining 22 items and the percentage of Self-Evaluation Committees rating each of them as High, in rank

order, were: 3(47.1%), 4(47.1%), 7(47.1%), 8(47.1%), 40(47.1%), 2(35.3%), 13(29.4%), 30(29.4%), 31(29.4%), 10(23.5%), 17(23.5%), 20(23.5%), 23(23.5%), 28(23.5%), 29(23.5%), 1(17.6%), 21(17.6%), 18(11.8%), 33(5.9%), 34(5.9%), 5(0%), and 16(0%).

Table 7, Evaluations of Physical Facilities presents the frequency of the responses and a percentage for each of the six items that deal with the evaluations of physical facilities of industrial arts in the 17 participating schools.

These data indicate that five of the six items were rated as Low by 49% or more of the Self-Evaluation Committees. The five items were: c(76.5%), a(64.7%), d(64.7%), b(58.8%), and f(52.9%). An analysis of these items showed that the members of the Self-Evaluation Committees were less than satisfied with: the health and safety measures in their shops; the space provided, and the layout of their shops; the storage space provided; the machinery and equipment provided; and the absence of bulletin boards and display cases, in their industrial arts shop.

The remaining item was rated High by 47.1% of the participants.

Comments

Nine Self-Evaluation Committees provided comments on the Physical Facilities of Industrial Arts. Their comments can be summarized as follows:

1. Four committees stated that water supply, sinks, and storage cupboards were needed in their industrial arts facility.

Table 7

Frequency of Percentage of Self-Evaluation Committees on the Evaluations of Physical Facilities

N=17

Item Statement	Frequency of Responses of Committees							Percent of Self-evaluation Committees Rating statements					
	Favourable		Undesirable				No Response	High		Low		Missing But Needed	Neither Applicable Nor Desirable
	4	3	2	1	ND	NA		4	3	2	1	ND	NA
e) How up to date is the equipment?	2	6	4	4	1	0		8/17 (47.1%)		8/17 (47.1%)		1/17 (5.9%)	
d) How adequate are provisions for storage?	1	3	5	6	2	0		4/17 (23.5%)		11/17 (64.7%)		2/17 (11.8%)	
a) How satisfactory are the space and layout of shops?	2	1	4	7	2	0	1	3/17 (17.6%)		11/17 (64.7%)		2/17 (11.8%)	
b) How adequate are the machinery and equipment?	0	3	2	8	4	0		3/17 (17.6%)		10/17 (58.8%)		4/17 (23.5%)	

Table 7 (Continued)

Item Statement	Frequency of Responses of Committees							Percent of Self-evaluation Committees Rating statements					
	Favourable		Undesirable				No Response	High		Low		Missing But Needed	Neither Applicable Nor Desirable
	4	3	2	1	ND	NA		4	3	2	1	ND	NA
c) How satisfactory are health and safety measures?	0	3	8	5	1	0			3/17 (17.6%)	13/17 (76.5%)		1/17 (5.9%)	
f) How adequate are bulletin boards and display cases or areas?	0	1	5	4	6	1			1/17 (5.9%)	9/17 (52.9%)		6/17 (35.3%)	1/17 (5.9%)

2. Two committees mentioned that the physical aspect of their industrial arts facility needed improvement. These committees felt that such improvement would help the industrial arts staff members in providing a better safety program.

3. One committee mentioned that owing to overcrowding in their school, the technical drawing room was used as a regular classroom for other subject areas. According to this committee, deliberate damage was done to the technical drawing furniture, equipment, and the teaching aids posted in the room.

4. One committee mentioned that although reasonable supervision was provided during work sessions, pilfering of tools was widespread in their industrial arts facility.

5. One committee mentioned that one room was being used for the entire industrial arts program. This committee stated that this room was very small, improperly located, and thus, was very hot and uncomfortable most of the time.

DIRECTION OF LEARNING

SUB-SECTION A. INSTRUCTIONAL STAFF

Table 8, Direction of Learning, Sub-section A: Instructional Staff, presents the frequency of the responses and a percentage for each of the 12 items in the checklist that deal with the instructional staff of industrial arts in the 17 participating schools. These data indicate that of the 12 items in the checklist, two items were rated as <u>High</u> (excellent or good), by 51% or more of those who were involved in the study, and five items were rated as <u>Low</u> (fair

Table 8

Frequency and Percentage of Self-Evaluation Committees on the Direction of Learning A: Instructional Staff

N=17

Item Statement	Frequency of Responses of Committees						No Response	Percent of Self-evaluation Committees Rating statements					
	Favourable		Undesirable					High		Low		Missing But Needed	Neither Applicable Nor Desirable
	4	3	2	1	ND	NA		4	3	2	1	ND	NA
8. Are members of the industrial arts staff aware of teaching problems in other areas and work for the improvement of the whole school program?	1	9	6	1	0	0		10/17 (58.8%)		7/17 (41.2%)			
4. Do members recognize the importance of activities in the instructional program?	2	7	6	1	1	0		9/17 (52.9%)		7/17 (41.2%)		1/17 (5.9%)	

Table 8 (Continued)

Item Statement	Frequency of Responses of Committees						No Response	Percent of Self-evaluation Committees Rating statements					
	Favourable		Undesirable					High		Low		Missing But Needed	Neither Applicable Nor Desirable
	4	3	2	1	ND	NA		4	3	2	1	ND	NA
1. Do members of the industrial arts staff possess and put into operation a well-defined contemporary philosophy of education?	0	8	4	0	5	0		8/17 (47.1%)		4/17 (23.5%)	5/17 (29.4%)		
11. To what extent do members maintain an active interest in professional advancement through participation in educational organizations and seminars?	1	6	7	1	2	0		7/17 (41.2%)		8/17 (47.1%)	2/17 (11.8%)		
3. Do members of the industrial arts staff manifest competence in a variety of teaching methods?	0	6	7	3	1	0		6/17 (35.3%)		10/17 (58.8%)	1/17 (5.9%)		

Table 8: Instructional Staff (Continued)

Item Statement	Frequency of Responses of Committees						No Response	Percent of Self-evaluation Committees Rating statements					
	Favourable		Undesirable					High		Low		Missing But Needed	Neither Applicable Nor Desirable
	4	3	2	1	ND	NA		4	3	2	1	ND	NA
6. Do members of the industrial arts staff keep abreast of professional literature, research, and development in the field of education?	2	3	5	2	5	0		5/17 (29.4%)		7/17 (41.2%)		5/17 (29.4%)	
7. To what extent do members discuss their curriculum and sponsor activities which help their colleagues to a better understanding of the program?	1	4	6	0	5	1		5/17 (29.4%)		6/17 (35.3%)		5/17 (29.4%)	1/17 (5.9%)
2. To what extent are members properly qualified and certified?	0	4	11	2	0	0		4/17 (23.5%)		13/17 (76.5%)			

Table 8 (Continued)

Item Statement	Frequency of Responses of Committees						No Response	Percent of Self-evaluation Committees Rating statements					
	Favourable		Undesirable					High		Low		Missing But Needed	Neither Applicable Nor Desirable
	4	3	2	1	ND	NA		4	3	2	1	ND	NA
9. To what extent do members understand counseling procedures and guidance services and help students with educational and vocational choices?	2	2	8	3	2	0		4/17 (23.5%)		11/17 (64.7%)		2/17 (11.8%)	
10. Are members of the industrial arts staff qualified in first aid and safety procedures?	0	3	4	5	5	0		3/17 (17.6%)		9/17 (52.9%)		5/17 (29.4%)	
5. To what extent do members invite parent and community reactions to the program?	0	2	2	5	7	1		2/17 (11.8%)		7/17 (41.2%)		7/17 (41.2%)	1/17 (5.9%)

Table 8: Instructional Staff (Continued)

Item Statement	Frequency of Responses of Committees							Percent of Self-evaluation Committees Rating statements					
	Favourable		Undesirable				No Response	High		Low		Missing But Needed	Neither Applicable Nor Desirable
	4	3	2	1	ND	NA		4	3	2	1	ND	NA
12. To what extent do members of the industrial arts staff have rapport with industry in the area?	0	2	7	4	4	0		2/17 (11.8%)		11/17 (64.7%)		4/17 (23.5%)	

to poor) by 49% or more of these participants. The two items that were rated as High were: 8(58.8%), and 4(52.9%). It would appear that the content of each of these statements was favourable to the members of the Self-Evaluation Committees.

The five items that were rated as Low by 49% or more of the participants were: 2(76.5%), 9(64.7%), 12(64.7%), 3(58.8%), and 10(52.9%). An analysis of these five items showed that the members of the Self-Evaluation Committees were less than satisfied with the qualification and certification of staff members; the knowledge staff members had of counselling procedures and guidance services; the limited extent staff members relate to industry in their respective areas; the competence of staff members in a variety of teaching methods; and, the limited knowledge staff members had in first aid and safety procedures.

The remaining five items and the percentage of Self-Evaluation Committees rating each of them as High in rank order, were: 1(47.1%), 11(41.2%), 6(29.4%), 7(29.4%), and 5(11.8%).

Table 9, Evaluations of Instructional staff, presents the frequency of the responses and a percentage for each of the five items that deal with evaluations of instructional staff of industrial arts in the 17 participating schools. These data indicate that one item was rated as High (excellent or good), by 51% or more of those who were involved in the study, and four items were rated as Low (fair to poor) by 49% or more of these participants. The

Table 9

Frequency and Percentage of Self-Evaluation Committees on the Evaluations of Instructional Staff

N=17

Item Statement	Frequency of Responses of Committees						No Response	Percent of Self-evaluation Committees Rating statements					
	Favourable		Undesirable					High		Low		Missing But Needed	Neither Applicable Nor Desirable
	4	3	2	1	ND	NA		4	3	2	1	ND	NA
a) To what extent do the members possess a well defined point of view toward industrial arts education?	0	9	4	1	2	0	1	9/17 (52.9%)		5/17 (29.4%)		2/17 (11.8%)	
b) To what extent do staff members possess satisfactory qualifications?	0	7	8	2	0	0		7/17 (41.2%)		10/17 (58.8%)			
e) How adequate is industrial experience of the staff?	2	5	6	4	0	0		7/17 (41.2%)		10/17 (58.8%)			

Table 9 (Continued)

Item Statement	Frequency of Responses of Committees							Percent of Self-evaluation Committees Rating statements					
	Favourable		Undesirable				No Response	High		Low		Missing But Needed	Neither Applicable Nor Desirable
	4	3	2	1	ND	NA		4	3	2	1	ND	NA
d) To what extent do staff members discuss educational problems with fellow teachers, their administrators, and with the lay public?	1	4	10	1	1	0		5/17 (29.4%)		11/17 (64.7%)		1/17 (5.9%)	
c) To what extent have staff members informed themselves about current educational literature and research?	0	4	8	3	2	0		4/17 (23.5%)		11/17 (64.7%)		2/17 (11.8%)	

item that was rated as High was: a(52.9%). It would appear that the content of this statement was favourable to the members of the Self-Evaluation Committees.

The four items that were rated as Low by 49% or more of the participants were: c(64.7%), d(64.7%), b(58.8%), and e(58.8%). An analysis of these four items showed that the members of the Self-Evaluation Committees were less than satisfied with: that industrial arts teachers informed themselves about current educational literature and research in industrial arts; the limited extent industrial arts teachers discussed educational problems with fellow teachers, their administrators, and the lay public; the qualification of industrial arts teachers; and, industrial arts staff members lack of industrial experience.

Table 10, Qualification of Industrial Arts Teachers in the Government Secondary Schools, presents the frequency of responses and a percentage for industrial arts teachers with (a) less than an industrial arts teacher's certificate, (b) those with industrial arts teacher's certificate or equivalent. These data indicate that there are 66.7% unqualified and 33.3% qualified industrial arts instructors in the 16 government secondary schools that completed this section of the research instrument. The data also indicate that there were no industrial arts teachers with a Bachelor's Degree or a Master's Degree in industrial arts in these schools at the time of the study.

Table 11, Semester Hours of Preparation of Industrial

Table 10

Qualification of Industrial Arts Teachers in the Government Secondary Schools

Education Level	N = 16	
	Frequency*	Percentage
Less than Industrial Arts Teachers' Certificate.	28	66.7%
Industrial Arts Teachers' Certificate or equivalent.	14	33.3%
Bachelors' Degree	0	0
Masters' Degree	0	0

*Frequency indicates the number of teachers in each category.

Table 11

Semester Hours of Preparation of Industrial Arts Teachers in the Government Secondary Schools

Semester Hours	N = 12	
	Frequency*	Percentage
0-11	7	21.2%
12-23	3	9%
24-48	2	6.1%
More than 48	21	63.6%

*Frequency indicates the number of teachers in each range.

Arts Teachers in the Government Secondary Schools, presents the frequency of responses and a percentage for the semester hours teachers in 12 of the 17 participating schools were prepared in industrial arts education. These data indicate that there are 63.6% of industrial arts teachers with more than 48 semester hours of preparation in industrial arts education, and 21.2% of industrial arts teachers with zero to eleven semester hours of preparation, where zero represents no semester hours of preparation in industrial arts education whatsoever.

Table 12, Number of Years since Teachers' last Formal Study of Industrial Arts, presents the frequency of responses and a percentage for the years since industrial arts teachers in 14 of the 17 participating schools had their **last** formal study of industrial arts education. These data indicate that there are 63.6% of industrial arts teachers whose last formal study of industrial arts education was zero to three years, and 21.2% of the teachers whose last formal study of industrial arts education was four to seven years.

Table 13, Previous Experience of Industrial Arts Teachers in the Government Secondary Schools, presents the frequency of responses and a percentage for the years of previous experience industrial arts teachers in 15 of the 17 participating schools had of industrial arts teaching. These data indicate that there are 41.7% of industrial arts teachers whose previous experience in industrial arts teaching was zero to two years, and 8.3% of the teachers

Table 12

Number of Years since Teachers' last formal Study of Industrial Arts

Years	N = 14 Frequency*	Percentage
0-3	21	63.6%
4-7	7	21.2%
8-12	5	15.2%
More than 12	0	0

*Frequency indicates the number of teachers in each range.

Table 13

Previous Experience of teachers in Industrial Arts Teaching in the Government Secondary Schools

N = 15

Years	Frequency*	Percentage
0-2	15	41.7%
3-5	6	16.7%
6-15	12	33.3%
More than 15	3	8.3%

*Frequency indicates the number of teachers in each range.

with more than 15 years of experience in industrial arts teaching.

Table 14, Areas of Specialization of Industrial Arts Teachers in the Government Secondary Schools, presents the frequency of responses and a percentage for the subject area in industrial arts in which teachers in 15 of the 17 participating schools were trained. These data indicate that industrial arts teachers in the 15 participating schools are trained in eight categories or subject areas in industrial arts, namely, Technical Drawing, Woodwork, Metalwork, Electricity, Ceramics, Plastics, Plumbing, and Leathercraft. These data also indicate that 100% of the schools have a specialist teacher in Technical Drawing, 86.7% of the schools have a specialist teacher in Woodwork, and 80.0% of the schools have a specialist teacher in Metalwork. There are only one or 6.7% of the teachers in the 15 schools who are trained to teach Plastics, Plumbing, or Leathercraft.

Comments

Nine of the 17 Self-Evaluation Committees provided comments on Instructional Staff of Industrial Arts. Their comments can be summarized as follows:

1. All nine of the committees mentioned that there was an acute shortage of qualified industrial arts teachers in their schools.

2. Two committees stated that the professional attitude of industrial arts staff members needed improvement.

3. One committee stated that some staff members were

Table 14

Areas of Specialization of Industrial Arts Teachers in the Government Secondary Schools

N = 15

Subject Areas	Frequency*	Percentage
Technical Drawing	15	100%
Woodwork	13	86.7%
Metalwork	12	80.0%
Electricity	4	26.7%
Ceramics	2	13.3%
Plastics	1	6.7%
Plumbing	1	6.7%
Leather craft	1	6.7%

*Frequency indicates the numbers of teachers that were trained in each subject area.

not genuinely interested in industrial arts, but, were using industrial arts teaching as a stepping stone to other better paid jobs.

4. One committee mentioned that all the teachers in their industrial arts facility were just out of school, and hence, lacked any experience in the area of industrial arts teaching. This committee recommended that the Ministry of Education should organize in-service seminars to help these teachers.

5. One committee stated the upgrading courses for industrial arts staff members organized by the Ministry of Education were very inadequate - the last one being organized in 1973.

6. One committee mentioned that the Ministry of Education should try to attract qualified individuals with industrial experience to teach in the various industrial arts facilities.

DIRECTION OF LEARNING

SUB-SECTION B. INSTRUCTIONAL ACTIVITIES

Table 15, Direction of Learning, Sub-Section B: Instructional Activities, presents the frequency of the responses and a percentage for each of the 20 items in the checklist that deal with instructional activities of industrial arts in the 17 participating schools. These data indicate that of the 20 items in the checklist, four items were rated as <u>High</u> (excellent or good) by 51% or more of the participants, six items were rated as <u>Low</u> (fair to poor)

Table 15

Frequency and Percentage of Self-Evaluation Committees on Direction of Learning B: Instructional Activities

N=17

Item Statement	Frequency of Responses of Committees						No Response	Percent of Self-evaluation Committees Rating statements					
	Favourable		Undesirable					High		Low		Missing But Needed	Neither Applicable Nor Desirable
	4	3	2	1	ND	NA		4	3	2	1	ND	NA
5. To what extent do students working in groups exchange ideas in the solution of problems?	3	9	4	1	0	0		12/17 (70.6%)		5/17 (29.4%)			
2. Are lesson plans and course outlines available for each area?	2	9	3	1	1	0	1	11/17 (64.7%)		4/17 (23.5%)		1/17 (5.9%)	

Table 15 (Continued)

Item Statement	Frequency of Responses of Committees							Percent of Self-evaluation Committees Rating statements					
	Favourable		Undesirable				No Response	High		Low		Missing But Needed	Neither Applicable Nor Desirable
	4	3	2	1	ND	NA		4	3	2	1	ND	NA
4. Are specific efforts directed toward the attainment of appropriate social relationships and good work habits?	1	9	3	3	1	0		10/17 (58.8%)		6/17 (35.3%)		1/17 (5.9%)	
11. Do students develop appropriate drawings and other plans and follow a systematic procedure in developing a problem or project?	1	9	6	0	1	0		10/17 (58.8%)		6/17 (35.3%)		1/17 (5.9%)	
1. Are objectives of the program stated in terms of expected student behavioral outcomes. Activities of the program can be shown to relate to objectives?	1	7	7	0	1	0	1	8/17 (47.1%)		7/17 (41.2%)		1/17 (5.9%)	

Table 15: Instructional Activities (Continued)

Item Statement	Frequency of Responses of Committees							Percent of Self-evaluation Committees Rating statements					
	Favourable		Undesirable				No Response	High		Low		Missing But Needed	Neither Applicable Nor Desirable
	4	3	2	1	ND	NA		4	3	2	1	ND	NA
6. To what extent do industrial arts education attempt to familiarize youth with management and production practices of industry as these affect both workers and the production of physical goods?	0	7	5	4	1	0		7/17 (41.2%)		9/17 (52.9%)		1/17 (5.9%)	
15. Are provisions made for students to participate in related extra-curricular activities?	0	7	3	1	0	1	5	7/17 (41.2%)		4/17 (23.5%)			1/17 (5.9%)

Table 15 (Continued)

Item Statement	Frequency of Responses of Committees							Percent of Self-evaluation Committees Rating statements					
	Favourable		Undesirable				No Response	High		Low		Missing But Needed	Neither Applicable Nor Desirable
	4	3	2	1	ND	NA		4	3	2	1	ND	NA
20. Do students with industrial arts aptitude have counseling avaliable on possibilities of continuing postsecondary industrial arts study?	1	6	2	4	4	0		7/17 (41.2%)		6/17 (35.3%)		4/17 (23.5%)	
7. Do activities provide an opportunity for boys and girls to become familiar with, and to use many of, the basic tools, materials, and machines of industry?	0	6	4	3	4	0		6/17 (35.3%)		7/17 (41.2%)		4/17 (23.5%)	

Table 15: Instructional Activities (Continued)

Item Statement	Frequency of Responses of Committees							Percent of Self-evaluation Committees Rating statements					
	Favourable		Undesirable				No Response	High		Low		Missing But Needed	Neither Applicable Nor Desirable
	4	3	2	1	ND	NA		4	3	2	1	ND	NA
10. Do students study the sources of materials and supplies, characteristics, and limitations of industrial products?	0	6	6	2	2	1		6/17 (35.3%)		8/17 (47.1%)		2/17 (11.8%)	1/17 (5.9%)
3. In developing each phase of the program, are specific provisions made for individual differences among students?	1	4	6	3	2	0	1	5/17 (29.4%)		9/17 (52.9%)		2/17 (11.8%)	
13. Are numerous activities designed to help students develop qualities of leadership?	0	5	7	4	1	0		5/17 (29.4%)		11/17 (64.7%)		1/17 (5.9%)	

Table 15 (Continued)

Item Statement	Frequency of Responses of Committees						No Response	Percent of Self-evaluation Committees Rating statements					
	Favourable		Undesirable					High		Low		Missing But Needed	Neither Applicable Nor Desirable
	4	3	2	1	ND	NA		4	3	2	1	ND	NA
17. Are a wide variety of suitable materials and techniques employed in instruction?	0	5	5	2	5	0		5/17 (29.4%)		7/17 (41.2%)	5/17 (29.4%)		
18. Are field trips that are related to shop experiences provided?	0	5	2	3	7	0		5/17 (29.4%)		5/17 (29.4%)	7/17 (41.2%)		
19. To what extent do students with industrial arts aptitude have counseling available on the possibilities of continuing in advanced industrial arts courses in high school?	1	4	3	4	4	1		5/17 (29.4%)		7/17 (41.2%)	4/17 (23.5%)		1/17 (5.9%)

Table 15: Instructional Activities (Continued)

Item Statement	Frequency of Responses of Committees							Percent of Self-evaluation Committees Rating statements					
	Favourable		Undesirable				No Response	High		Low		Missing But Needed	Neither Applicable Nor Desirable
	4	3	2	1	ND	NA		4	3	2	1	ND	NA
9. To what extent do students learn how a variety of commercial products are made?	0	3	9	4	1	0			3/17 (17.6%)		13/17 (76.5%)	1/17 (5.9%)	
12. Are community resources used as aids to instruction?	0	3	8	2	3	1			3/17 (17.6%)		10/17 (58.8%)	3/17 (17.6%)	1/17 (5.9%)
8. Do students conduct appropriate tests and experiments which pertain to science and industry?	0	2	1	3	10	1			2/17 (11.8%)		4/17 (23.5%)	10/17 (58.8%)	1/17 (5.9%)
14. Do students draw on many out-of-school sources of information in fulfilling assignments?	0	2	9	1	4	1			2/17 (11.8%)		10/17 (58.8%)	4/17 (23.5%)	1/17 (5.9%)

Table 15 (Continued)

Item Statement	Frequency of Responses of Committees						No Response	Percent of Self-evaluation Committees Rating statements					
	Favourable		Undesirable					High		Low		Missing But Needed	Neither Applicable Nor Desirable
	4	3	2	1	ND	NA		4	3	2	1	ND	NA
16. To what extent do students take an active part in the safety program by serving as student safety supervisors, solving thought-inducing safety problems, and taking safety tests?	0	1	6	0	8	2		1/17 (5.9%)		6/17 (35.3%)		8/17 (47.1%)	2/17 (11.8%)

and one item was rated as ND - Missing But Needed by 49% or more of the participants. The four items that were rated as High, in rank order, were: 5(70.6%), 2(64.7%), 4(58.8%), and 11(58.8%). It would appear that the content of each of these statements was favourable to the members of the Self-Evaluation Committees.

The six items that were rated as Low by 49% or more of the participants, in rank order, were: 9(76.5%), 13(64.7%), 12(58.8%), 14(58.8%), 3(52.9%), and 6(52.9%). An analysis of these six items showed that the members of the Self-Evaluation Committees were less than satisfied with: the variety of commercial products students were taught to make; the lack of activities in the industrial arts program designed to help students develop leadership qualities; the amount of community resources used as aids to instruction; the amount of out-of-school sources of information students used in completing industrial arts assignments; the lack of specific provisions in the industrial arts program to cater for the individual differences of the students; and the lack of any provision in the industrial arts program for familiarizing students with management and production practices of industry as these affect both workers and the production of physical goods.

The statement that was rated as ND - Missing But Needed by 49% or more of the participants was, 8(58.8%). An analysis of this statement showed that the members of these Self-Evaluation Committees would welcome more test

and experiments which pertain to science and industry to be conducted by students in their industrial arts program.

The remaining nine item statements, and the percentage of Self-Evaluation Committees that rated each of them as High, in rank order, were: 1(47.1%), 15(41.2%), 20(41.2%), 7(35.3%), 10(35.3%), 17(29.4%), 18(29.4%), 19(29.4%), and 16(5.9%).

Table 16, Evaluations of Instructional Activities, presents the frequency of the responses and a percentage for each of the five items that deal with the evaluations of instructional activities of industrial arts in the 17 participating schools. These data indicate that four of the five items were rated as Low (fair to poor) by 49% or more of the Self-Evaluation Committees. These four items, in rank order, were: a(64.7%), c(64.7%), b(58.8%), and d(52.9%). An analysis of these items showed that the participants were less than satisfied that: the instructional activities in industrial arts effectively relate to the needs of students and the goals of the program; the instructional activities in industrial arts effectively met community goals; there were adequate planning and preparation for instructional activities in industrial arts; and, that students' needs for leisure time activities were being met by the instructional activities in industrial arts.

Comments

Eight Self-Evaluation Committees provided comments on Instructional Activities of Industrial Arts. Their comments

Table 16

Frequency and Percentage of Self-Evaluation Committees on the Evaluations of Instructional Activities

N=17

Item Statement	Frequency of Responses of Committees						No Response	Percent of Self-evaluation Committees Rating statements					
	Favourable		Undesirable					High		Low		Missing But Needed	Neither Applicable Nor Desirable
	4	3	2	1	ND	NA		4	3	2	1	ND	NA
b) How adequate is the planning and preparation for instructional activities?	0	7	9	1	0	0		7/17 (41.2%)		10/17 (58.8%)			
a) How effectively do instructional activities relate to student needs and program goals?	0	6	9	2	0	0		6/17 (35.3%)		11/17 (64.7%)			
e) How effectively do teachers work with staff in other academic areas to provide more effective instruction?	0	5	6	2	4	0		5/17 (29.4%)		8/17 (47.1%)		4/17 (23.5%)	

Table 16 (Continued)

Item Statement	Frequency of Responses of Committees						No Response	Percent of Self-evaluation Committees Rating statements					
	Favourable		Undesirable					High		Low		Missing But Needed	Neither Applicable Nor Desirable
	4	3	2	1	ND	NA		4	3	2	1	ND	NA
c) How effectively do instructional activities meet community needs?	0	4	8	3	1	1		4/17 (23.5%)		11/17 (64.7%)		1/17 (5.9%)	1/17 (5.9%)
d) How adequately are the students' needs for leisure-time activities being met?	0	3	6	3	4	1		3/17 (17.6%)		9/17 (52.9%)	4/17 (23.5%)		1/17 (5.9%)

can be summarized as follows:

1. Two committees stated that the students in their industrial arts program were given the opportunity to plan and make projects of value, and so feel the joy of accomplishment.

2. Two committees mentioned that owing to the lack of adequate personnel and equipment in the area of industrial arts, the activities planned did not reflect either the needs of the students or the community. One of these committees stated that students were very interested in metalwork, electricity, and power mechanics, but, instructors in these subject areas of industrial arts were not available.

3. One committee mentioned that there was need for industrial arts teachers to correlate their program with that of other subject areas, such as, mathematics and science.

4. One committee stated that more instructional aids and models were needed in industrial arts if the program were to be meaningful.

5. One committee mentioned that the industrial arts facility was treated by "academic" teachers as the maintenance section of the school. This committee stated that offtimes classes in the department were interrupted by a teacher seeking repairs to a piece of school furniture.

6. One committee stated that their students were involved in work study activities in various departments of the bauxite industry in the area. This committee mentioned that while this work study program was the link between industry and the school - the school lacked qualified indus-

trial arts staff members and adequate physical facilities to make the industrial arts program meaningful.

DIRECTION OF LEARNING

SUB-SECTION C. INSTRUCTIONAL MATERIALS

Table 17, Direction of Learning, Sub-section C: Instructional Materials, presents the frequency of the responses and a percentage for each of the eight items in the checklist that deal with instructional materials of industrial arts in the 17 participating schools. These data indicate that of the eight items in the checklist, none of the items was rated as High, one item was rated as Low (fair to poor), and one item was rated as ND - Missing But Needed by 49% or more of those who were involved in the study. The item that was rated as Low was: 3(70.6%). An analysis of this item showed that the members of these Self-Evaluation Committees were less than satisfied with the amount of reference materials in industrial arts that were available to both teachers and students.

The item that was rated as ND - Missing But Needed by 49% or more of the participants was: 7(52.9%). An analysis of this item showed that the members of these Self-Evaluation Committees would welcome more programmed or individualized instructional materials in industrial arts for their respective facilities.

The remaining six item statements and the percentage of Self-Evaluation Committees rating each of them as High

Table 17

Frequency and Percentage of Self-Evaluation Committees on the Direction of Learning C: Instructional Materials

N=17

Item Statement	Frequency of Responses of Committees						No Response	Percent of Self-evaluation Committees Rating statements					
	Favourable		Undesirable					High		Low		Missing But Needed	Neither Applicable Nor Desirable
	4	3	2	1	ND	NA		4	3	2	1	ND	NA
8. To what extent are teacher-prepared materials such as study guides, course outlines, and resource units available?	0	8	4	4	1	0		8/17 (47.1%)		8/17 (47.1%)		1/17 (5.9%)	
6. Are teaching aids consisting of miniature, cutaway, and actual-size projects and devices provided?	0	6	5	2	4	0		6/17 (35.3%)		7/17 (41.2%)		4/17 (23.5%)	

Table 17 (Continued)

Item Statement	Frequency of Responses of Committees							Percent of Self-evaluation Committees Rating statements					
	Favourable		Undesirable				No Response	High		Low		Missing But Needed	Neither Applicable Nor Desirable
	4	3	2	1	ND	NA		4	3	2	1	ND	NA
2. Are up-to-date textbooks available?	0	5	0	6	6	0		5/17 (29.4%)		6/17 (35.3%)		6/17 (35.3%)	
5. Are posters, charts, graphs, and pictures available?	0	3	3	4	7	0		3/17 (17.6%)		7/17 (41.2%)		7/17 (41.2%)	
3. To what extent are appropriate reference materials available in each area?	0	2	7	5	3	0		2/17 (11.8%)		12/17 (70.6%)		3/17 (17.6%)	
1. To what extent are current resource units and teaching guides of the city, country, or state available?	0	1	2	6	7	1		1/17 (5.9%)		8/17 (47.1%)		7/17 (41.2%)	1/17 (5.9%)

Table 17: Instructional Materials (Continued)

Item Statement	Frequency of Responses of Committees						No Response	Percent of Self-evaluation Committees Rating statements					
	Favourable		Undesirable					High		Low		Missing But Needed	Neither Applicable Nor Desirable
	4	3	2	1	ND	NA		4	3	2	1	ND	NA
4. Are descriptive materials and commercial products available for instruction?	0	1	1	5	7	3			1/17 (5.9%)	6/17 (35.3%)		7/17 (41.2%)	3/17 (17.6%)
7. Are programmed instructional materials available?	0	0	5	3	9	0				8/17 (47.1%)		9/17 (52.9%)	

in rank order, were: 8(47.1%), 6(35.3%), 2(29.4%), 5(17.6%), 1(5.9%), and 4(5.9%).

Table 18, Evaluations of Instructional Materials, presents the frequency of the responses and a percentage for each of the three items that deal with the evaluations of instructional materials of industrial arts in the 17 participating schools. These data indicate that one of the three items was rated as Low (fair to poor) by 49% or more of the participants. This item was: c(52.9%). An analysis of this item that was rated as Low showed that the members of these Self-Evaluation Committees were less than satisfied with the variety of instructional resources that were available to industrial arts staff members in the government secondary schools.

The remaining two items and the percentage of Self-Evaluation Committees rating each of them as High were: a(41.2%), and b(23.5%).

Comments

Six Self-Evaluation Committees provided comments on Instructional Materials of Industrial Arts. All six of the committees mentioned that there was a dire need for all types of instructional materials in industrial arts. These committees stated that the few books, charts, and the like, that were available, were very outdated. These committees also recommended that the Ministry of Education should:

(i) provide a state curriculum guide in industrial arts;

Table 18

Frequency and Percentage of Self-Evaluation Committees

on Evaluations of Instructional Materials

N=17

Item Statement	Frequency of Responses of Committees						No Response	Percent of Self-evaluation Committees Rating statements					
	Favourable		Undesirable					High		Low		Missing But Needed	Neither Applicable Nor Desirable
	4	3	2	1	ND	NA		4	3	2	1	ND	NA
a) How extensively are teaching guides used?	1	6	5	3	2	0		7/17 (41.2%)		8/17 (47.1%)		2/17 (11.8%)	
b) To what degree are good quality and appropriate texts and reference materials available?	0	4	2	6	5	0		4/17 (23.5%)		8/17 (47.1%)		5/17 (29.4%)	
c) How adequate is the variety of instructional resources?	0	1	5	4	7	0		1/17 (5.9%)		9/17 (52.9%)		7/17 (41.2%)	

(ii) provide more up-to-date posters, charts, text-books, and audio-visual equipment which would be used in accordance with this guide; and,

(iii) provide the necessary materials and equipment in accordance with this curriculum guide.

DIRECTION OF LEARNING

SUB-SECTION D. METHODS OF EVALUATION

Table 19, Direction of Learning, Sub-section D. Methods of Evaluation, presents the frequency of the responses and a percentage for each of the 15 items in the checklist that deal with methods of evaluation of industrial arts in the 17 participating schools. These data indicate that of the 15 items in the checklist, four items were rated as High (excellent or good), by 51% or more of those who were involved in the study, three items were rated as Low (fair to poor), and one item was rated as ND - Missing But Needed by 49% or more of these participants. The items that were rated as High, in rank order, were: 1(70.6%), 10(58.8%), 11(58.8%), and 2(52.9%). It would appear that the content of each of these statements was favourable to the members of the Self-Evaluation Committees.

The three statements that were rated as Low by 49% or more of the participants were: 4(64.7%), 15(64.7%), and 5(52.9%). An analysis of these three items showed that the members of the Self-Evaluation Committees were less than satisfied that: industrial arts staff members record objective data and anecdotal information as part of their

Table 19

Frequency and Percentage of Self-Evaluation Committees on the Direction of Learning D: **Methods of Evaluation**

N=17

Item Statement	Frequency of Responses of Committees						No Response	Percent of Self-evaluation Committees Rating statements					
	Favourable		Undesirable					High		Low		Missing But Needed	Neither Applicable Nor Desirable
	4	3	2	1	ND	NA		4	3	2	1	ND	NA
1. To what extent is evaluation considered an integral part of the teaching-learning process?	2	10	5	0	0	0		12/17 (70.6%)		5/17 (29.4%)			
10. To what extent data obtained from tests and other evaluative devices are used to help students know what they have done well and what needs to be improved?	2	8	5	1	1	0		10/17 (58.8%)		6/17 (35.3%)		1/17 (5.9%)	

Table 19 (Continued)

Item Statement	Frequency of Responses of Committees						No Response	Percent of Self-evaluation Committees Rating statements					
	Favourable		Undesirable					High		Low		Missing But Needed	Neither Applicable Nor Desirable
	4	3	2	1	ND	NA		4	3	2	1	ND	NA
11. Are comparisons made between articles developed by students in the industrial arts program and commercial products?	2	8	6	0	1	0		10/17 (58.8%)		6/17 (35.3%)	1/17 (5.9%)		
2. Is a continuous program of evaluation employed to determine the extent to which students achieve established goals or objectives?	1	8	6	0	2	0		9/17 (52.9%)		6/17 (35.3%)	2/17 (11.8%)		
5. Are periodic evaluations made of current course content and methods?	0	8	7	2	0	0		8/17 (47.1%)		9/17 (52.9%)			

Table 19: Methods of Evaluation (Continued)

Item Statement	Frequency of Responses of Committees						No Response	Percent of Self-evaluation Committees Rating statements					
	Favourable		Undesirable					High		Low		Missing But Needed	Neither Applicable Nor Desirable
	4	3	2	1	ND	NA		4	3	2	1	ND	NA
8. Is individual progress recorded and becomes a part of the cumulative record of the student, to be used for guidance purposes?	1	7	2	2	5	0		8/17 (47.1%)		4/17 (23.5%)		5/17 (29.4%)	
6. Is evaluation of student progress based on a variety of related criteria and suitable techniques of appraisal?	0	7	4	4	1	1		7/17 (41.2%)		8/17 (47.1%)		1/17 (5.9%)	1/17 (5.9%)
3. Does student participation in the evaluation procedures a part of the learning situation?	1	5	5	3	3	0		6/17 (35.3%)		8/17 (47.1%)		3/17 (17.6%)	

Table 19 (Continued)

Item Statement	Frequency of Responses of Committees							Percent of Self-evaluation Committees Rating statements					
	Favourable		Undesirable				No Response	High		Low		Missing But Needed	Neither Applicable Nor Desirable
	4	3	2	1	ND	NA		4	3	2	1	ND	NA
7. To what extent evaluation is related to differences among student aptitudes, abilities, and knowledge?	0	6	5	3	1	2		6/17 (35.3%)		8/17 (47.1%)		1/17 (5.9%)	2/17 (11.8%)
14. Is teacher self-evaluation conducted at regular intervals?	0	6	5	3	3	0		6/17 (35.3%)		8/17 (47.1%)		3/17 (17.6%)	
4. To what extent do industrial arts teachers carefully record objective data and anecdotal information?	1	3	8	3	2	0		4/17 (23.5%)		11/17 (64.7%)		2/17 (11.8%)	

Table 19: Methods of Evaluation (Continued)

Item Statement	Frequency of Responses of Committees							Percent of Self-evaluation Committees Rating statements					
	Favourable		Undesirable				No Response	High		Low		Missing But Needed	Neither Applicable Nor Desirable
	4	3	2	1	ND	NA		4	3	2	1	ND	NA
9. Are student judgments of industrial arts experiences secured near the end of courses and at specified times following graduation?	0	4	6	0	5	0	2	4/17 (23.5%)		6/17 (35.3%)		5/17 (29.4%)	
15. To what extent are evaluation instruments for appraisal of both factual content and manipulative activities used?	0	4	7	4	2	0		4/17 (23.5%)		11/17 (64.7%)		2/17 (11.8%)	
12. Are records made of each student injury in the school shop and are they compiled and analyzed regularly?	0	1	2	3	7	3	1	1/17 (5.9%)		5/17 (29.4%)		7/17 (41.2%)	3/17 (17.6%)

Table 19 (Continued)

Item Statement	Frequency of Responses of Committees							Percent of Self-evaluation Committees Rating statements					
	Favourable		Undesirable				No Response	High		Low		Missing But Needed	Neither Applicable Nor Desirable
	4	3	2	1	ND	NA		4	3	2	1	ND	NA
13. Are industrial arts equipment and facilities inspected periodically by fire prevention and safety experts?	0	1	1	2	10	2	1	1/17 (5.9%)		3/17 (17.6%)		10/17 (58.8%)	2/17 (11.8%)

evaluation process; industrial arts staff members used evaluation instruments for appraisal of both factual content and manipulative activities; any periodic evaluations were made of current content and methods used in industrial arts.

The item that was rated as ND - Missing But Needed by 49% or more of the participants was: 13(64.7%). An analysis of this statement showed that the members of these Self-Evaluation Committees would welcome periodic inspection of their industrial arts facility by fire prevention or safety experts.

The remaining seven items and the percentage of Self-Evaluation Committees rating each of them as High in rank order, were: 5(47.1%), 8(47.1%), 6(41.2%), 3(35.3%), 7(35.3%), 14(35.3%), and 9(35.3%).

Table 20, Evaluations of Methods of Evaluations, presents the frequency of the responses and a percentage for each of the four items that deal with the evaluations of methods of evaluation of industrial arts in the 17 participating schools. These data indicate that all four items were rated as Low, (fair to poor) by 49% or more of the participants. These items, in rank order, were: a(64.7%), d(64.7%), b(58.8%), and c(52.9%). An analysis of these four items showed that the members of the Self-Evaluation Committees were less than satisfied that: the evaluation instruments used in their industrial arts program were appropriate; there was adequate inspection of their industrial arts facilities; the evaluation procedures used in

Table 20

Frequency and Percentage of Self-Evaluation Committees on the Evaluations of Methods of Evaluation

N=17

Item Statement	Frequency of Responses of Committees							Percent of Self-evaluation Committees Rating statements					
	Favourable		Undesirable				No Response	High		Low		Missing But Needed	Neither Applicable Nor Desirable
	4	3	2	1	ND	NA		4	3	2	1	ND	NA
d) How satisfactory is the inspection of the school shop and its facilities?	0	4	7	4	2	0		4/17 (23.5%)		11/17 (64.7%)		2/17 (11.8%)	
a) How appropriate are the evaluation instrument?	0	3	8	3	2	0	1	3/17 (17.6%)		11/17 (64.7%)		2/17 (11.8%)	
b) How satisfactory are the evaluation procedures used in the program?	0	2	8	2	3	2		2/17 (11.8%)		10/17 (58.8%)		3/17 (17.6%)	2/17 (11.8%)

Table 20 (Continued)

Item Statement	Frequency of Responses of Committees						No Response	Percent of Self-evaluation Committees Rating statements					
	Favourable		Undesirable					High		Low		Missing But Needed	Neither Applicable Nor Desirable
	4	3	2	1	ND	NA		4	3	2	1	ND	- NA
c) How effectively are changes implemented following an evaluation of the program?	0	1	8	1	4	3		1/17 (5.9%)		9/17 (52.9%)		4/17 (23.5%)	3/17 (17.6%)

industrial arts were satisfactory; any effective changes were implemented following inspection of their facility.

Comments

Two Self-Evaluation Committees provided comments on Methods of Evaluation of Industrial Arts. These committees stated that much improvement was needed in terms of appropriate evaluation instruments, evaluation procedures, and inspection of the school shop and its facilities. These committees mentioned that timetabling of examination by the administrative staff of the school often caused problems in carrying out evaluation procedures thought adequate by industrial arts staff members.

OUTCOMES

Table 21, Outcomes, presents the frequency of the responses and a percentage for each of the 12 items in the checklist that deal with the outcomes of industrial arts in the 17 participating schools. These data indicate that of the 12 items in the checklist, 10 items were rated as Low (fair to poor) by 49% or more of those who were involved in the study. These items were: l(88.2%), e(76.5%), i(70.6%), j(70.6%), b(64.7%), d(64.7%), k(64.7%), f(58.8%), g(58.8%), and a(52.9%). An analysis of each of these items showed that the members of the Self-Evaluation Committees were less than satisfied that: the content of the industrial arts program helped students to understand and appreciate labour-management problems; students developed or discovered any interest, aptitudes, and abilities in industrial arts;

Table 21

Frequency and Percentage of Self-Evaluation Committees on the Outcomes of Industrial Arts
N=17

Item Statement	Frequency of Responses of Committees						No Response	Percent of Self-evaluation Committees Rating statements					
	Favourable		Undesirable					High		Low		Missing But Needed	Neither Applicable Nor Desirable
	4	3	2	1	ND	NA		4	3	2	1	ND	NA
h) To what extent are students developing positive attitudes and good practices relating to safety?	0	8	8	0	1	0		8/17 (47.1%)		8/17 (47.1%)		1/17 (5.9%)	
a) To what extent do students possess a knowledge and understanding of the properties and use of important raw materials?	0	7	6	3	0	1		7/17 (41.2%)		9/17 (52.9%)			1/17 (5.9%)

Table 21 (Continued)

Item Statement	Frequency of Responses of Committees						No Response	Percent of Self-evaluation Committees Rating statements					
	Favourable		Undesirable					High		Low		Missing But Needed	Neither Applicable Nor Desirable
	4	3	2	1	ND	NA		4	3	2	1	ND	NA
f) To what extent do students develop an appreciation of good design, construction, and craftsmanship?	0	7	10	0	0	0		7/17 (41.2%)		10/17 (58.8%)			
c) To what extent are students developing a reasonable degree of skill in the use of basic tools and machines?	0	6	6	2	2	1		6/17 (35.3%)		8/17 (47.1%)		2/17 (11.8%)	
g) To what extent are youth developing an ability to select, care for, and use industrial products intelligently?	0	6	8	2	1	0		6/17 (35.3%)		10/17 (58.8%)		1/17 (5.9%)	

Table 21: Outcomes of Industrial Arts (Continued)

Item Statement	Frequency of Responses of Committees						No Response	Percent of Self-evaluation Committees Rating statements					
	Favourable		Undesirable					High		Low		Missing But Needed	Neither Applicable Nor Desirable
	4	3	2	1	ND	NA		4	3	2	1	ND	NA
b) To what extent do students possess a knowledge and understanding of basic industrial processes?	0	5	8	3	1	0		5/17 (29.4%)		11/17 (64.7%)		1/17 (5.9%)	
d) To what extent do students develop an ability to organize and perform their work efficiently?	0	5	11	0	0	0	1	5/17 (29.4%)		11/17 (64.7%)			
i) How extensively do students develop constructive leisure-time activities or hobbies relating to the industrial arts?	0	4	6	6	1	0		4/17 (23.5%)		12/17 (70.6%)		1/17 (5.9%)	

Table 21 (Continued)

Item Statement	Frequency of Responses of Committees						No Response	Percent of Self-evaluation Committees Rating statements					
	Favourable		Undesirable					High		Low		Missing But Needed	Neither Applicable Nor Desirable
	4	3	2	1	ND	NA		4	3	2	1	ND	NA
k) To what extent do students understand the phenomenon of technology, the role of the individual in relation to it, and its role in cultural exchange?	0	4	7	4	2	0			4/17 (23.5%)		11/17 (64.7%)		2/17 (11.8%)
e) To what extent are interests, aptitudes, and abilities in the industrial arts discovered and developed by students?	0	3	13	0	1	0			3/17 (17.6%)		13/17 (76.5%)		1/17 (5.9%)
j) To what extent do students possess information about various industrial occupations and industries?	0	3	9	3	2	0			3/17 (17.6%)		12/17 (70.6%)		2/17 (11.8%)

Table 21: Outcomes of Industrial Arts (Continued)

Item Statement	Frequency of Responses of Committees						No Response	Percent of Self-evaluation Committees Rating statements					
	Favourable		Undesirable					High		Low		Missing But Needed	Neither Applicable Nor Desirable
	4	3	2	1	ND	NA		4	3	2	1	ND	NA
1) To what extent do students understand and have an appreciation for labor-management problems?	0	0	11	4	2	0				15/17 (88.2%)		2/17 (11.8%)	

students developed any constructive leisure-time activities, or hobbies relating to industrial arts; students possessed any information about the various industrial occupations and industries; students possessed any knowledge and understanding of basic industrial processes; students developed any ability to organize and perform their work efficiently; students understood the phenomenon of technology, the role of the individual in relation to it, and its role in cultural exchange; students developed any appreciation of good design, construction, and craftmanship; students developed any ability to select, care for, and use industrial products intelligently; students possessed any knowledge and understanding of the properties and use of important raw materials.

The remaining two items and the percentage of Self-Evaluation Committees that rated each of them as High, were h(47.1%), and c(35.3%).

SPECIAL CHARACTERISTICS OF INDUSTRIAL ARTS

This section of the research instrument was divided into three categories for the collection of information on the special characteristics of industrial arts in the government secondary schools. The first and second categories consisted of the following two questions: "In what respects is the industrial arts program most satisfactory and commendable"? and, "In what respect is the industrial arts program in need of improvement"? The third category consisted of the following statement: "Recommend, in order

of priority, steps for improvement of weaknesses in the industrial arts program". The more common and more significant reports were organized and listed as to each of the three categories as follows:

1. In what respects is the industrial arts program most satisfactory and commendable?

(a) Five schools reported that the industrial arts program equipped students with some of the skills that enabled them to make a choice in a technical career. One of these schools reported that quite a few of their graduates were now pursuing technical studies at the University of Guyana and overseas.

(b) Four schools reported that the area of Technical Drawing and Metalwork - despite the limited tools and equipment - were very commendable in terms of students achievement in these areas.

(c) Two schools reported that apart from the development of basic skills, the industrial arts program helped students inculcate desirable attitudes and understanding relevant to the needs of society.

2. In what respects is the industrial arts program most in need of improvement?

(a) Ten schools reported that their industrial arts program needed improvement in the areas of staff, floor space, tools and equipment, up-to-date text books and reference materials, and funding.

(b) Four schools reported that more time should be

available for industrial arts.

(c) Three schools reported that the industrial arts curriculum should be expanded to include such subject areas as metalwork, electricity, welding, and power mechanics.

(d) One school reported that apart from reorganizing the whole industrial arts program, the Ministry of Education should stipulate that industrial arts supervisors visit industrial arts facilities at least once in every two weeks, and advise head of departments as to how the program in that particular school could be improved. This school also mentioned that industrial arts supervisors should be experienced teachers who, because of their experience, might be able to anticipate and quickly suggest remedies to the variety of problems that were prevalent in the various industrial arts facilities.

3. Recommend, in order of priority, steps for improvement of weaknesses in the industrial arts program.

Fifteen schools recommended steps for the improvement of weaknesses in the industrial arts program. A summary of these steps are as follows:

(a) Nine schools recommended that only qualified industrial arts teachers should be appointed as head of departments - whether acting or otherwise. These schools reported that the Ministry of Education should make an effort to train more industrial arts teachers, or try to attract qualified personnel from industry or a particular trade to teach in the industrial arts facilities.

(b) Four schools recommended that all industrial arts facilities should be equipped with adequate and relevant tools and equipment in the industrial arts subject areas taught in these schools. Three of these schools reported that more power tools were required in the various industrial arts facilities.

(c) Three schools recommended that the grant for industrial arts should be increased. One of these schools reported that because of the difficulty in obtaining this grant, there was always a shortage of supplies in the industrial arts facility.

(d) Three schools recommended that more time, up-to-date and relevant instructional materials and activities were needed. One of these schools recommended the scrapping of the examination, "Design and Technology", Ordinary Level of the London University. This school reported that the industrial arts program was restricted to the activities and subject areas stipulated by this examination rather than to the needs of the students or the country.

(e) One school recommended that more research in industrial arts should be undertaken by both the Ministry of Education and individual industrial arts staff members.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

SUMMARY

This investigation reports the results of an evaluation of the industrial arts program in 17 of the 31 government secondary schools in Guyana. The major problem of the study was to conduct an evaluation of the industrial arts program in the government secondary schools, since industrial arts was not evaluated since it was introduced into these schools.

The research instrument selected for the collection of data for this study was a modified version of Section 4-10, Industrial Arts of the Evaluative Criteria, Fourth Edition published by the National Study of Secondary School Evaluation.

The researcher travelled to the Republic of Guyana in May, 1977 to conduct the research. Site visits were made by the researcher to the 10 participating government secondary schools in the capital, Georgetown. Due to the scarcity of funds, the researcher was able to make site visits to only 15 of the 21 participating government secondary schools in the rural areas. Of the 31 government secondary schools that offer a program in industrial arts 17 or 54.8% returned completed research instruments. All 17 of the completed research instruments returned were usable.

The collected data were analysed by hand. Responses were tabulated and were presented as frequency tables. Percentages were used to illustrate the number of participants who responded to each statement on the research instrument. A rank order for each percentage for each section and sub-section of the research instrument was established.

For the study it was decided that if 51% or more of the Self-Evaluation Committees rated an item statement as High (excellent or good), the members favourably accepted the item statement. Similarly, if 49% or more of the Self-Evaluation Committees rated an item statement as Low (fair to poor), the members considered the item as undesirable and modification or improvement was needed in that part of the industrial arts program. The two other categories, ND - "Missing But Needed" and NA - "Neither Applicable Nor Desirable" used in the study were classified similar to those items rated as Low. From these data the findings of the study were determined.

The more common and more significant comments that were made by the Self-Evaluation Committees for each section or sub-section of the research instrument were organized and presented at the end of each section.

CONCLUSIONS

Organization of Industrial Arts

Five of the 15 items in the checklist that deal with

Organization of Industrial Arts were considered as favourable and one item was considered as undesirable by those who were involved in the study. Two of the three items in the Evaluations of Organization were also considered as undesirable by these participants. An analysis of these items in the checklist that were considered undesirable showed that participants were very dissatisfied with the length of class periods in the various subject areas of industrial arts. This was substantiated by the ratings participants assigned to item 'b' in the Evaluations of Organization, where members were not satisfied that the schedules, time allotments, and class sizes in industrial arts were appropriate. Participants also felt that the grant provided by the government for industrial arts was grossly inadequate.

Though the percentage of Self-Evaluation Committees rating each of the remaining nine items in the checklist did not satisfy the criteria for a decision - either favourable or undesirable - to be made concerning these statements, committee members, however, showed some dissatisfaction for a number of these statements. Items six and seven in the checklist that were rated fair to poor by 47.1% and 41.2% of the participants respectively, showed that these participants were not too happy with their class sizes and the budget provided for the industrial arts program - a feeling already forcibly expressed by participants in the ratings they assigned to items 'b' and 'c' of the Evaluations of Organization of Industrial Arts.

Checklist items 15, 12, and 4 each rated as missing but needed by 41.2% of the Self-Evaluation Committees showed that participants desired more scope for industrial arts teachers of the same grade levels to plan their program together; more daily non teaching conference periods, and more scope for students to use the industrial arts facilities outside of regular class time.

Some of these findings were further supported by the comments made by participants to this section of the research instrument that dealt with the Organization of Industrial Arts. Four committees reported that the space allocated for industrial arts was inadequate, given the number of students who attended classes at any one time. Three committees reported that the grant provided for industrial arts was too small; while two committees reported that time was always insufficient to conduct a good lesson.

Of the eight subject areas in industrial arts reported by participants as being taught in the government secondary schools, only Technical Drawing (Drafting), Woodwork, and to a limited extent Metalwork, could be considered as regular course offerings in these secondary schools.

Nature of Offerings

Because 11 of the 17 items in the checklist that deal with Nature of Offerings of Industrial Arts were considered as favourable and only one item was considered as undesirable by those who were involved in the study, one would be tempted

to conclude that the participants were satisfied with the nature of offerings or objectives of the industrial arts program. On the contrary, these same participants have shown strong disapproval for the nature or content of the industrial arts program by rating each of the four items in the Evaluations of Nature of Offerings of Industrial Arts, as undesirable, and thus, modification or improvement was very much needed in these parts of the program.

Committee members felt that the content of the industrial arts program did not provide students with any significant group activities or projects that involved problem solving situations. These committee members did not consider the information and experiences offered in the industrial arts program as being related to modern industry, nor did the members feel that the program helped students develop labour management problems. Participants also felt that the scope and sequence of the industrial arts courses were not related to the interest, abilities, or developmental needs of the students, nor that the program of studies in industrial arts was flexible enough to meet the needs of all students. Members who were involved in the study also did not consider the offerings of the industrial arts program as providing students with exploratory or tryout experiences with a variety of tools, materials, and industrial processes, nor did members feel that students developed any attitudes of responsibility and leadership from the industrial arts program.

These findings were further supported by the comments made by participants to this section of the research instruments that dealt with the Nature of Offerings of Industrial Arts. One Self-Evaluation Committee reported that more planning should be done at the Industrial Arts section of the Ministry of Education, so that an up-to-date curriculum guide could be made available to all industrial arts teachers. This committee felt that such a move by the Ministry of Education would help staff members in planning a better program. Another committee reported that inadequate space, materials, and tools limit the nature of offerings in their school. One committee reported that the time alloted for industrial arts courses, and the fact that the school was geared at providing students to write external examinations did not allow for the industrial arts program to be geared to the needs of the students.

Physical Facilities

Five of the 40 items in the checklist that deal with Physical Facilities of Industrial Arts were considered favourable, three items were considered as undesirable, and 10 items were considered as missing but needed by those who were involved in the study. The remaining 22 items were inconclusive owing to the ratings assigned to each of these items by participants not satisfying the criteria for judgment stipulated for this study. However, participants considered five of the six items in the Evaluation of Physical Facilities as undesirable.

The members of the Self-Evaluation Committees were dissatisfied with: the quantity and variety of tools, instruments, and equipment provided for industrial arts; the health and safety measures in their industrial arts facilities; the floor space provided and the layout of the industrial arts facility; the machinery provided and the absence of bulletin boards, and display cases in their industrial arts facilities.

An analysis of the 10 items rated as missing but needed, and the comments made by participants to this section of the research instrument that dealt with Physical Facilities of Industrial Arts, tended to support the above findings. Committee members reported that their industrial arts departments needed the following equipment or facility: a display case; a fire extinguisher; additional washing and drinking facilities; a library or planning section; one or more tackboards; properly located water, gas, electrical, and compressed air facilities; a centrally located tool panel; student lockers; a properly ventilated finishing area; and the availability of audio-visual equipment to aid in their teaching of industrial arts.

Some of the comments reported by the participants that substantiated these findings were: four committees reported that water supply, sinks, and storage cupboards were needed in their industrial arts department. Two committees reported that the physical aspect of their industrial arts department needed improvement. These committees felt that

such improvement would help the industrial arts staff members in providing a better safety program. One committee reported that one room was being used for the entire industrial arts program. This committee stated that this room was very small, improperly located, and thus, was hot and uncomfortable most of the time.

Direction of Learning A: Instructional Staff

Two of the 12 items in the checklist that deal with Instructional Staff of Industrial Arts were considered as favourable, and five items were considered as undesirable by those who were involved in the study. Four of the five items in the Evaluations of Instructional Staff were also considered as undesirable by participants.

Committee members were dissatisfied with the qualification of the industrial arts teachers in their respective schools, as pointed out by the ratings they assigned to both the checklist and evaluation items. This was further substantiated by members reporting that two-thirds of the teachers responsible for teaching industrial arts were not qualified to do so; and that most of the teachers, including both qualified and unqualified teachers, last formal study of industrial arts was between zero and three years, where zero represented no study of industrial arts whatsoever. Other major concerns of the participants were: the limited knowledge industrial arts teachers had of guidance and counseling procedures; the limited extent teachers related to industry

in their respect areas; industrial arts teachers lack of competence in a variety of teaching methods; the limited knowledge industrial arts teachers had in first aid and safety procedures; the limited extent industrial arts teachers informed themselves about current educational literature and research in industrial arts; the limited extent industrial arts teachers discussed educational problems with fellow teachers, their administrators; and, industrial arts teachers' lack of industrial experiences.

These findings were further supported by the comments made by participants to this section of the research instrument that dealt with the Instructional Staff of Industrial Arts. Nine committees reported that there was an acute shortage of qualified teachers in their industrial arts facilities. Two committees reported that the professional attitude of industrial arts teachers needed improvement. One committee reported that all the teachers in their industrial arts facility were just out of school, and hence, lacked any experience in the area of industrial arts teaching. This committee recommended that the Ministry of Education should organize in-service seminars to help these teachers. One committee reported that the upgrading courses for industrial arts teachers organized by the Ministry of Education were very inadequate - the last one being organized in 1973.

Direction of Learning B: Instructional Activities

Four of the 20 items in the checklist that deal with

Instructional Activities of Industrial Arts were considered as favourable, six items were considered as undesirable, and one item was considered as missing but needed by those who were involved in the study. Four of the five items in the Evaluations of Instructional Activities were also considered as undesirable by participants.

By the ratings they assigned to both checklist and evaluations items, participants were not satisfied that there were any specific provisions in the industrial arts program to cater for the individual differences and the needs of students, or for that matter, the goals of the program or the community. Participants also felt that planning and preparation for instructional activities in industrial arts were inadequate, and thus, students needs for leisure-time activities were not being met in the industrial arts program. Other areas of the industrial arts program that dealt with instructional activities that participants felt needed improvement or modification were: the variety of commercial products students were taught to make; the activities in the industrial arts program designed to help students develop leadership qualities; the amount of community or outside resources used as aid to instruction, and by students in fulfilling industrial arts assignments; and provisions in the industrial arts program for familiarizing students with management and production practices of industry. Participants also felt that there was a dire need for more tests and experiments

that pertained to science and industry to be conducted by students in their industrial arts program.

These findings were substantiated by the comments reported by participants to this section of the research instrument that dealt with Instructional Activities of Industrial Arts. Two committees reported that owing to the lack of adequate teaching personnel and equipment in the area of industrial arts, the activities planned did not reflect either the needs of the students or the community. One of these committees mentioned that students were interested in metalwork, electricity, and power mechanics, but instructors in these subject areas of industrial arts were not available. One committee reported that their students were involved in work study activities in various departments of the bauxite industry in the area. This committee mentioned that while this work study program was the link between industry and the school - the school lacked qualified industrial arts staff members and adequate physical facilities to make the industrial arts program meaningful.

Direction of Learning C: Instructional Materials

Of the eight items in the checklist that deal with Instructional Materials in Industrial Arts, one item was considered as undesirable, and one item was considered as missing but needed by those who were involved in the study. One of the three items in the Evaluations of Instructional Materials was also considered undesirable by participants.

An analysis of these items considered undesirable, revealed that participants were dissatisfied with the amount of reference materials and the variety of instructional resources in industrial arts that were available to them. Participants also felt that there was an urgent need for more programmed or individualized instructional materials in all the subject areas of industrial arts that were taught in the government secondary schools.

These findings were supported by the comments reported by participants to this section of the research instrument that dealt with Instructional Materials of Industrial Arts. Six committees reported that there was a dire need for all types of instructional materials in industrial arts. These committees mentioned that the books, charts, and the like, that were available, were very outdated. These committees also recommended that the Ministry of Education should:

(i) provide a state curriculum guide in industrial arts;

(ii) provide more up-to-date posters, charts, text books, and audio-visual equipment which would be used in accordance with this guide; and,

(iii) provide the necessary materials and equipment in accordance with this curriculum guide.

Direction of Learning D: Methods of Evaluation

Four of the items in the checklist that deal with Methods of Evaluation of Industrial Arts were considered

as favourable, three items were considered as undesirable, and one item was considered as missing but needed by those who were involved in the study. All four of the items in the Evaluations of Methods of Evaluation were considered as undesirable by participants.

Committee members did not feel that the evaluation instrument or the evaluation procedures used in their industrial arts program were either appropriate or satisfactory. Committee members also felt that their industrial arts facilities were not adequately inspected, or if inspected, no effective changes ever resulted following these inspections. These committee members were not satisfied that industrial arts teachers recorded objective data and anecdotal information as part of their evaluation process; or that industrial arts teachers used evaluation instruments for appraisal of both factual content and manipulative activities; and, these participants were also not satisfied that any periodic evaluations were made of current content and methods in industrial arts.

An analysis of the statement considered missing but needed by participants revealed that the members of the Self-Evaluation Committees would welcome periodic inspection of their industrial arts facilities by fire prevention or safety experts.

In their comments to this section of the research instrument that dealt with Methods of Evaluation of

Industrial Arts, participants reported that much improvement was needed in terms of appropriate evaluation instruments, evaluation procedures, and inspection of industrial arts facilities. These participants mentioned that time-tabling of examinations by the administrative staff of the school often caused problems in implementing evaluation procedures thought adequate by industrial arts staff members.

Outcomes of Industrial Arts

Ten of the 12 items in the checklist that deal with the Outcomes of Industrial Arts were considered as undesirable by those who were involved in the study. An analysis of these items considered as undesirable by participants revealed that the members of the Self-Evaluation Committees were less than satisfied that: the content of the industrial arts program helped students to understand and appreciate labour management problems; students developed or discovered any interest, aptitudes, and abilities in industrial arts; students developed any constructive leisure-time activities, or hobbies relating to industrial arts; students possessed any information about the various industrial occupations and industries; students possessed any knowledge and understanding of the properties and use of important raw materials; students developed any ability to organize and perform their work effectively; students understood the phenomenon of technology, the role of the individual in relation to it, and its role in cultural exchange; students developed any appreciation of good design, construction, and craftmanship;

students developed any ability to select, care for, and use industrial products intelligently; and that students possessed any knowledge and understanding of the properties and use of important raw materials.

No comments were reported for this section of the research instrument that dealt with the Outcomes of Industrial Arts.

RECOMMENDATIONS

The following 10 recommendations are offered to focus attention on the major problems identified as a result of this study. These recommendations are presented in order of priority.

1. The data show that two-thirds of the teachers responsible for industrial arts instruction in the various government secondary schools have not had any preparation in industrial arts at the secondary level. Therefore, for the safety of the students, and the improvement of industrial arts education in Guyana, it is recommended that the Ministry of Education immediately stop employing individuals with limited trade or industrial arts teaching experience as teachers, and seriously consider upgrading the teaching ability of the present group of unqualified instructors by means of in-service seminars. These seminars can be conducted by qualified industrial arts teachers and the industrial arts supervisor in each school district.

2. The current industrial arts program in the government

secondary schools of Guyana is too narrow in scope. Not only is the content narrow with respect to course offerings, but instructional content within the courses themselves is not as broad as both students and teachers would have liked. This study reveals a concentration of instruction in the traditional subject areas, such as technical drawing, woodwork, and to a limited extent metalwork. It is recommended that the industrial arts curriculum of the government secondary schools be revised so as to include new and innovative concepts and more instructional content reflecting such subject areas as electricity and power mechanics in all the schools.

3. It is recommended that serious consideration be given to the improvement of physical facilities with specific attention to the following items: space for industrial arts facilities be increased to provide for additional work and storage space, finishing room, and a planning section which could be located away from noise and dust; when additional space is planned, room layout, and lighting be designed for more effective instruction; power equipment be provided in each industrial arts facility with additional space to house this equipment; locker facilities, and more adequate washing and drinking facilities provided for both students and teachers; tackboard, display cases, and audio-visual aids, including films, film-strips, slides, and projectors should be provided; and office and filing space be provided for teachers.

4. It is recommended that the Ministry of Education replace the present unit shop in the government secondary schools by a multiple activity type of industrial arts laboratory. This move would help with the staff and facilities problems as fewer teachers and hand tools are needed in this type of industrial arts facility.

5. It is recommended that in planning new industrial arts facilities or in remodeling old facilities planners should include as members of their advisory teams, such personnel as industrial arts teachers, administrators, supervisors, and architects, so that these individuals could discuss their needs and have them incorporated in the plan.

6. It is recommended that the industrial arts grant be distributed to schools in accordance with the needs of individual industrial arts departments, rather than by its present theoretical approach of equal distribution. It is a well known fact that much needed industrial arts dollars are returned to the treasury department each year, because of this approach to distribution of the grant. It is further recommended that industrial arts supervisors in their visits to the various schools attest to the urgent needs of individual industrial arts departments, and thus, insure a meaningful allocation of industrial arts dollars.

7. It is recommended that, because of the organizational pattern of the industrial arts facilities in the government

secondary schools; because of the number of work stations, tools, equipment, and supplies provided; and because of safety; class sizes in laboratory or practical lessons in industrial arts do not exceed 20 students.

8. The data show that the instructional time provided for industrial arts in the various government secondary schools was unsuitable for laboratory or practical lessons in woods, metals, among others. Therefore, it is recommended that serious consideration be given to rescheduling industrial arts classes so that students may have at least one double period for each practical lesson.

9. It is recommended that all industrial arts teachers should have an unassigned period during the school day in which they can do planning, have student conferences, and maintain laboratory equipment.

10. It is recommended that the Ministry of Education should provide enough funds so that research personnel could execute an evaluation of this type once every five years. Periodic studies every five years would give the profession valuable information relative to trends and developments of industrial arts in the government secondary schools.

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APPENDICES

APPENDIX A.

RELATED CORRESPONDENCE

FACULTY OF EDUCATION
DEPARTMENT OF INDUSTRIAL AND VOCATIONAL EDUCATION
TELEPHONE (403) 432-3678

THE UNIVERSITY OF ALBERTA
EDMONTON, ALBERTA, CANADA
T6G 0Y1

February 21, 1977

The Executive Secretary
National Study of School Evaluation
2201 Wilson Boulevard
Arlington, Virgina
22216, U.S.A.

Dear Sir/Madam:

I am a student from the Republic of Guyana currently enrolled at the University of Alberta in a program leading to the Master of Education Degree in Industrial and Vocational Education.

In fulfillment of the requirements for this degree, I must write a thesis, and for my research I have chosen, An Evaluation of the Industrial Arts Program in the Secondary Schools in Guyana. These schools cater to pupils whose ages range from 11 to 17. Therefore, I shall greatly appreciate if you will send me all information or if possible, a copy of your latest edition of the Junior High/ Middle School Evaluative Criteria.

I write also to seek your kind assistance in securing the necessary permission to use this instrument. I assure you that should permission be forthcoming, this fact would be noted in an appropriate place in the reporting phase of my study.

With much appreciation for your assistance and cooperation in this matter.

Yours sincerely,

Leyland F. Thompson

LFT/pm

Executive Secretary
DONALD C. MANLOVE
School of Education
Indiana University
Bloomington, Indiana 47401
812 337-7181

Business Manager
HELEN McGRAW
National Study of
School Evaluation
2201 Wilson Boulevard
Arlington, Virginia 22201
703-522-1511

NATIONAL STUDY OF SCHOOL EVALUATION

Chairman
RICHARD J. BRADLEY
New England Association of Schools and Colleges, Inc.
131 Middlesex Turnpike
Burlington, Massachusetts 01803

General Committee
(*Administrative Committee)

Middle States Association
EVERETT A. ADAMS
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PAUL R. BINGAMAN
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ARCHIE R. JORDAN

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* VERNON D. PACE
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ROBERT STAKE

Northwest Association
G. DON FOSSATTI
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CLIFFORD HARMALA

Southern Association
JOSEPH M. JOHNSTON
* JOHN H. LOUNSBURY
DURELL RUFFIN
JOHN J. SANTILLO
ROBERT WEBB

Western Association
THOMAS F. DAMON
* ROBERT D. MORGANS
ROBERT L. REEVES

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National Association of Secondary School Principals
ERNEST N. MANNINO
Department of State
WILLIAM L. PHARIS
National Association of Elementary School Principals
JOHN R. PROFFITT
United States Office of Education

March 2, 1977

Mr. Leyland F. Thompson
Department of Industrial
& Vocational Education
The University of Alberta
Edmonton, Alberta, Canada
T6G 0Y1

Dear Mr. Leyland:

I am not entirely clear as to the specific kinds of information you are seeking. If your research involves the evaluation of an industrial arts program, you should procure a copy of Section 4-10, Industrial Arts, from the Evaluative Criteria, Fourth Edition. I am enclosing a price list and order form and will check the specific section you should procure.

If you plan to use the Junior High/Middle School Evaluative Criteria, which is obviously a different evaluative instrument but one equally as good, you should secure a copy of Section VI, Subject Areas. In evaluating any instructional program the evaluator uses this section and responds to the items in terms of the instructional area being evaluated. A price list and order form for that section is also enclosed.

Permission is granted to use either of the sections in your research study. It should be clear that this permission covers only the research study.

If there are additional questions, please let me hear from you.

Sincerely yours,

Donald C. Manlove

Donald C. Manlove
Executive Secretary

DCM:kjd

Enclosures

APPENDIX B.

EVALUATIVE INSTRUMENT

FOR INDUSTRIAL ARTS

EVALUATIVE INSTRUMENT
FOR INDUSTRIAL ARTS

NAME OF SCHOOL _____ DATE _____

ADDRESS _____

PREPARED BY _____

_____

_____

_____

INSTRUCTION FOR SELF-EVALUATION IN INDUSTRIAL ARTS

This evaluative instrument is designed for the school personnel to make a Self-Evaluation of industrial arts.

Procedures: First, the school should set up a committee consisting of the principal, the industrial arts department head and where applicable, his staff, and a student representative. The criteria for selecting this student are:

(a) The student must have been involved in the industrial arts program for no less than three years.

(b) The student should have obtained an average mark of 60 or greater in industrial arts at the previous annual examinations.

(c) This student should be involved in the industrial arts program at the time of the investigation.

Second, a chairman should be appointed who would be responsible for calling a meeting of all members of the committee to discuss and study the purpose and procedures of this evaluation, before proceeding through their duties.

The points for evaluation of the industrial arts program are organized into the following areas:

Part I Organization. This covers such matters as how the curriculum is developed, whether there is continuity in the organization of studies in the area of industrial arts.

Part II Nature of Offerings. This category will evaluate how adequate the industrial arts program is.

Part III Physical facilities. This includes such consideration as furniture, visual aids, and general classroom conditions.

Part IV Direction of learning divided into areas of:

a) Instructional staff. This covers preparation, background, and organization of staff;

b) Instructional activities;

c) Instructional materials;

d) Methods of evaluation.

Part V Outcomes. This covers assessment of what students have learned in the program.

Part VI Special characteristics of the program in the area of industrial arts.

Each part of this Self-Evaluation consists of items which are found in an effective industrial arts program. From these items, it is possible for the committee to make a judgement and rate the industrial arts program in their school in relation to the philosophy and objectives of that school, and the needs of the students. In rating, the committee's chairman should simply encircle the number corresponding to the committee's judgement on that item.

If the provision or item is not found in the school but it is needed, encircle the ND or NEEDED rating.

If the provision or item is neither desirable nor applicable, encircle the NA or NOT APPLICABLE rating.

Each part of the instrument is provided with a space for the committee's comments. Comments are desirable and are considered to be one of the most important aspects of the entire evaluation. Hence, if possible, this researcher would appreciate if the committee would write comments on their program in order of preference for improving the industrial arts program.

CRITERIA FOR MAKING JUDGMENT ON RATING

When a judgment is made on an evaluation item use the ratings defined below. These ratings should be considered in the light of how well the industrial arts program is fulfilling the objectives and the needs of the students.

RATINGS	CRITERIA FOR JUDGMENT
4	EXCELLENT
3	GOOD
2	FAIR
1	POOR
ND	MISSING BUT NEEDED
NA	NEITHER APPLICABLE NOR DESIRABLE

I. ORGANIZATION

Checklist

1. Is the program of industrial arts education available to all students?	ND	NA	1	2	3	4
2. Are specific industrial arts objectives or goals identified with each course offering?	ND	NA	1	2	3	4
3. Is the industrial arts program so organized that it can be adjusted to the demands of new situation?	ND	NA	1	2	3	4
4. Are Industrial arts facilities available to students, under proper supervision, outside regular class time?	ND	NA	1	2	3	4
5. Are class periods of sufficient length to produce progress in learning?	ND	NA	1	2	3	4
6. Is the class size determined by such factors as type of activity, available space and safety of students?	ND	NA	1	2	3	4
7. Does the school budget provide adequate funds to support all elements of the industrial arts program?	ND	NA	1	2	3	4
8. Is program development a co-operative endeavor involving administrators, supervisors, teachers, and lay people. Do teachers and students work together in planning on the classroom level?	ND	NA	1	2	3	4
9. Is the industrial arts program coordinated with other courses?	ND	NA	1	2	3	4
10. Do staff members cooperate with the public relations efforts of the school?	ND	NA	1	2	3	4

11. Are repair and production jobs permitted in the industrial arts program only if they are desirable educational experiences for students? ND NA 1 2 3 4

12. Is a daily nonteaching, conference period, free from regularly assigned duties, provided for each teacher carrying a full schedule of classes? ND NA 1 2 3 4

13. Are occupational information and guidance an integral part of the program? ND NA 1 2 3 4

14. Do teachers of the various grade levels plan together to develop a sequential program in industrial arts? ND NA 1 2 3 4

15. Do teachers of the same grade level plan together to develop the industrial arts program at that level? ND NA 1 2 3 4

Supplementary Data (Fill in the following table for all courses in industrial arts.)

Title of Course	Form	Enrollment	Range of Class Size	Per Week	
				No. of Periods	Total Minutes

Evaluations

a) To what extent are industrial arts courses available to all students? ... ND NA 1 2 3 4

b) How appropriate are schedules, time allotments, and class sizes for industrial arts course offerings? ... ... ND NA 1 2 3 4

c) How adequate is financial support for the industrial arts program? ... ... ND NA 1 2 3 4

Comments

II. NATURE OF OFFERINGS

Checklist

1. Do the courses provide opportunities for youth to plan, construct, and evaluate projects suitable to their interests and aptitudes? ... ... ND NA 1 2 3 4

2. Are experiences provided in selected areas so that a degree of skill in the use of common tools and machines may be developed commensurate with the student's ability and the scope of the program? ... ... ND NA 1 2 3 4

3. Is broad content developed in each course in the program from representative industrial processes and materials appropriate for a school shop? ... ... ND NA 1 2 3 4

4. Has the part that industry played in the development of the Guyanese way of life emphasized in each course area? ... ... ND NA 1 2 3 4

5. Are basic skills and concepts applied to the solution of technical problems? ... ... ND NA 1 2 3 4

6. Are specific efforts in the program directed towards the development in each individual, an attitude of pride and interest in doing useful things? .. ND NA 1 2 3 4

7. Are specific efforts directed toward the development of a working knowledge of industrial materials and processes? .... ND NA 1 2 3 4

8. Is emphasis placed on the development of better understanding of such problems as appropriateness of material to use, quality of workmanship, design, and function.? ND NA 1 2 3 4

9. Are specific efforts made to develop an awareness of the variety of activities performed in our industrial environment that provide possibilities for leisure-time activities? .... ND NA 1 2 3 4

10. Is an overview of working conditions and labor-management problems included in the instructional program. ... ... ND NA 1 2 3 4

11. Is emphasis placed on developing an ability to select, care for, and use industrial products intelligently? ... ... ND NA 1 2 3 4

12. Are basic skills, such as reading, writing, arithmetic, speaking, and listening, continually emphasized and made a part of the instructional program? ... ... ND NA 1 2 3 4

13. Is emphasis placed on a continuous and coordinated departmental program of safety? .... ND NA 1 2 3 4

14. Are activities in the program organized to provide significant group activities and projects that involve situations that are likely to involve problems? ... ... ND NA 1 2 3 4

15. Are student-centered activities emphasized in teaching-learning process? ... ... ND NA 1 2 3 4

16. Are experiences provided to acquaint the student with the world of work, including its changing nature, and to help develop a wholesome attitude toward work.? ... ... ND NA 1 2 3 4

17. Are students provided an opportunity for in-depth specialization in areas of their respective aptitudes and interests? ... ... ND NA 1 2 3 4

Evaluations

a) To what extent are the information and experiences offered in the program related to modern industry? ... ... ND NA 1 2 3 4

b) To what extent are scope and sequence of courses related to the interests, abilities, and developmental needs of students? .... ND NA 1 2 3 4

c) To what extent do the offerings provide exploratory or tryout experiences with a variety of tools, materials, and industrial processes? ... ... ND NA 1 2 3 4

d) To what extent do students understand labor-management problems? .... ND NA 1 2 3 4

e) To what extent is student responsibility and leadership developed? ..... ND NA 1 2 3 4

f) To what extent is the program flexible to meet the needs of all students? .... ND NA 1 2 3 4

Comments

III. PHYSICAL FACILITIES

Checklist

1.	Are facilities appropriately located as a unit for students as well as for adult evening classes.?	ND	NA	1	2	3	4
2.	Is the total floor area consistent with accepted standards?	ND	NA	1	2	3	4
3.	Is natural light effectively controlled to eliminate glare. Is sufficient supplemental artificial light, properly diffused and distributed, provided. Is local lighting provided in critical work areas? ...	ND	NA	1	2	3	4
4.	Are floors in good condition and are suited to the area in which they are located; are precautions taken against slippery floors, special attention being given to machine areas?	ND	NA	1	2	3	4
5.	Is exhaust ventilation equipment available in areas where excessive heat, fumes, gases, and dust are produced?	ND	NA	1	2	3	4
6.	Where needed, are properly designed and located gas, water, electrical, and compressed air facilities provided?	ND	NA	1	2	3	4
7.	Do each school shop facility has a minimum of two entrance-exit doors that each measure 36 inches or more in width?	ND	NA	1	2	3	4
8.	Is the ceiling height appropriate, i.e., between 12 feet and 14 feet in all school shops and drawing rooms; and where applicable, are ceilings constructed of a material having a high coefficient of sound absorption?	ND	NA	1	2	3	4
9.	Is each shop equipped with appropriately located fire extinguishers of the correct type and size?	ND	NA	1	2	3	4

10. Are shop walls durable and easily cleaned from floor to top-of-door height. Are sound-absorbing materials used on upper walls surfaces wherever the amount of noise suggests special wall treatment? ... ... ND NA 1 2 3 4

11. Are washing facilities and drinking fountain of appropriate design and location provided? ... ND NA 1 2 3 4

12. Is a display case of a sufficient size, properly lighted and appropriately located, provided? ... ... ND NA 1 2 3 4

13. Is Convenient office or desk space provided? ... ... ND NA 1 2 3 4

14. Is a filing space located near the instructor's desk and is adequate for all necessary records, pamphlets, and illustrative materials? ... ... ND NA 1 2 3 4

15. Does the school shop contain a convenient and centrally located tool and supply center and, where applicable, an adequate number of well-laid-out tool panel areas for special tools? ND NA 1 2 3 4

16. Are the principles of "color dynamics", with moderation, followed throughout each of the shops and on equipment? ... ... ND NA 1 2 3 4

17. Is safe storage provided for all supplies; do the storage area accommodate full-length stock and all materials? ... ... ND NA 1 2 3 4

18. Are adequate storage areas provided for student projects under construction as well as for articles in the assembling and finishing stages? ... . ND NA 1 2 3 4

19. Are lockers adequate in number and size and are they located so as to avoid crowding? ... ... ND NA 1 2 3 4

20. To what extent is the equipment arranged with reference to the sequence of operations and their relationship to other areas. Is adequate clearance as dictated by the function of the machine, provided around all equipment? ... ND NA 1 2 3 4

21. Are work stations sufficient in number to provide flexibility? .... ND NA 1 2 3 4

22. To what extent is a finishing area with the following characteristics provided in each shop where the facility is important: adequate in size, appropriately located, properly lighted and ventilated, easily supervised, and relatively free from dust? ... ... ND NA 1 2 3 4

23. Are a demonstration and discussion area, with space for each student, provided in all shops? ... ... ND NA 1 2 3 4

24. Are the shop library and planning facilities located conveniently but away from major machine noises and dirty areas of the shop. Is adequate space provided for the storage of books, magazines, and folders? ... ... ND NA 1 2 3 4

25. Are the facilities provided for using instructional materials appropriate to their purpose and are they conveniently located? ... ... ND NA 1 2 3 4

26. Are tools and machines selected on the basis of their instructional value? ... ND NA 1 2 3 4

27. To what extent do the quantity and variety of tools, instruments, and equipment provided meet the needs of the program? ... ... ND NA 1 2 3 4

28. Are unit-type machines with self-contained motors used throughout the program; is equipment adapted to the size and maturity of the students, i.e., height from the floor to the working surface of a machine, horsepower, speed, and capacity? ... ... ND NA 1 2 3 4

29. To what extent are all power machines and manually operated equipment provided with effective guards that are used by the operators at all times? ... ... ND NA 1 2 3 4

30. Are conveniently located and appropriately painted switches or control boxes provided on all power machines. Are these easily accessible from the position of the operator? ... ... ND NA 1 2 3 4

31. Is a master electrical panel conveniently located in each shop. Do all machines that are wired in with the building provided with disconnect switches and have controls providing undervoltage and overload protection. Are all machines grounded? ... ... ND NA 1 2 3 4

32. To what extent do all tools and equipment used in school shops receive proper maintenance? ... ... ND NA 1 2 3 4

33. Are appropriately identified safety zones marked around machines and in areas where there are potential hazards? ... ... ND NA 1 2 3 4

34. Are safety clothing and protective devices worn? .... ND NA 1 2 3 4

35. Are one or more well-located, permanent chalkboards, ample in size and in good condition, provided in each school shop or drawing room? ... . ND NA 1 2 3 4

36. Are one or more well-located tackboards, ample in size and in good condition, provided in each shop. ... ND NA 1 2 3 4

37. Are motion picture, filmstrip, slide, and opaque projectors and screens available? ... ... ND NA 1 2 3 4

38. Are Industrial arts shops clean and neat? ... ... ND NA 1 2 3 4

39. To what extent are good planning and organization in evidence? ..... ND NA 1 2 3 4

40. Are custodial services sufficient? ... ND NA 1 2 3 4

Evaluations

a) How satisfactory are the space and layout of shops? ... ... ND NA 1 2 3 4

b) How adequate are the machinery and equipment? ... ... ND NA 1 2 3 4

c) How satisfactory are health and safety measures? ... ... ND NA 1 2 3 4

d) How adequate are provisions for storage? ... ... ND NA 1 2 3 4

e) How up to date is the equipment? .... ND NA 1 2 3 4

f) How adequate are bulletin boards and display cases or areas? ... ... ND NA 1 2 3 4

Comments

IV. DIRECTION OF LEARNING

A. Instructional Staff

Checklist

1. Do members of the industrial arts staff possess and put into operation a well-defined contemporary philosophy of education? ... ... ND NA 1 2 3 4

2. To what extent are members properly qualified and certified? ... ... ND NA 1 2 3 4

3. Do members of the industrial arts staff manifest competence in a variety of teaching methods? ... ... ND NA 1 2 3 4

4. Do members recognize the importance of activities in the instructional program? ... ... ND NA 1 2 3 4

5. To what extent do members invite parent and community reactions to the program? ... ... ND NA 1 2 3 4

6. Do members of the industrial arts staff keep abreast of professional literature, research, and development in the field of education? ... ... ND NA 1 2 3 4

7. To what extent do members discuss their curriculum and sponsor activities which help their colleagues to a better understanding of the program? .... ND NA 1 2 3 4

8. Are members of the industrial arts staff aware of teaching problems in other areas and work for the improvement of the whole school program? ... ... ND NA 1 2 3 4

9. To what extent do members understand counseling procedures and guidance services and help students with educational and vocational choices? ... ... ND NA 1 2 3 4

10. Are members of the industrial arts staff qualified in first aid and safety procedures? ... ... ND NA 1 2 3 4

11. To what extent do members maintain an active interest in professional advancement through participation in educational organizations and seminars? ... ... ND NA 1 2 3 4

12. To what extent do members of the industrial arts staff have rapport with industry in the area? ... ... ND NA 1 2 3 4

Supplementary Data

1. Indicate the number of professional staff found in each of the following categories (do not count the same individual more than once in a, b, c, and d respectively):

a) Educational level:

Less than Industrial Arts Teacher's Certificate..... _____

Industrial Arts Teacher's Certificate. _____

Bachelor's Degree. ..... _____

Master's Degree. ..... _____

b) Numbers of hours (approximate) of preparation in industrial arts:

0-11 ... _____

12-23 ... _____

24-48 ... _____

More than 48 ... _____

c) Years since last formal study in industrial arts:

0-3 ... _____

4-7 ... _____

8-12 ... _____

More than 12 ... _____

d) Previous experience in years:

0-2 ... _____

3-5 ... _____

6-15 ... _____

More than 15 _____

2. List areas of specialization in industrial arts of each staff member.

Evaluations

a) To what extent do the members possess a well-defined point of view toward industrial arts education? ... ... ND NA 1 2 3 4

b) To what extent do staff members possess satisfactory qualifications? ... ... ND NA 1 2 3 4

c) To what extent have staff members informed themselves about current educational literature and research? ... ND NA 1 2 3 4

d) To what extent do staff members discuss educational problems with fellow teachers, their administrators, and with the lay public? ... ... ND NA 1 2 3 4

e) How adequate is the industrial experience of the staff? ... ... ND NA 1 2 3 4

Comments

IV. DIRECTION OF LEARNING (Cont'd)

B. Instructional Activities

Checklist

1.	Are objectives of the program stated in terms of expected student behavioral outcomes. Activities of the program can be shown to relate to objectives?	ND	NA	1	2	3	4
2.	Are lesson plans and course outlines available for each area?	ND	NA	1	2	3	4
3.	In developing each phase of the program, are specific provisions made for individual differences among students?	ND	NA	1	2	3	4
4.	Are specific efforts directed toward the attainment of appropriate social relationships and good work habits?	ND	NA	1	2	3	4
5.	To what extent do students working in groups exchange ideas in the solution of problems?	ND	NA	1	2	3	4
6.	To what extent do industrial arts education attempt to familiarize youth with management and production practices of industry as these affect both workers and the production of physical goods?	ND	NA	1	2	3	4
7.	Do activities provide an opportunity for boys and girls to become familiar with, and to use many of, the basic tools, materials, and machines of industry?	ND	NA	1	2	3	4
8.	Do students conduct appropriate tests and experiments which pertain to science and industry? ...	ND	NA	1	2	3	4
9.	To what extent do student learn how a variety of commercial products are made?	ND	NA	1	2	3	4
10.	Do students study the sources of materials and supplies, characteristics, and limitations of industrial products?	ND	NA	1	2	3	4

11. Do students develop appropriate drawings and other plans and follow a systematic procedure in developing a problem or project? ... ... ND NA 1 2 3 4

12. Are community resources used as aids to instruction? .... ND NA 1 2 3 4

13. Are numerous activities designed to help students develop qualities of leadership? ... ... ND NA 1 2 3 4

14. Do students draw on many out-of-school sources of information in fulfilling assignments? .... ND NA 1 2 3 4

15. Are provisions made for students to participate in related extracurricular activities? ... ... ND NA 1 2 3 4

16. To what extent do students take an active part in the safety program by serving as student safety supervisors, solving thought-inducing safety problems, and taking safety tests? ... ... ND NA 1 2 3 4

17. Are a wide variety of suitable materials and techniques employed in instruction? ... ... ND NA 1 2 3 4

18. Are field trips that are related to shop experiences provided? ... ... ND NA 1 2 3 4

19. To what extent do students with industrial arts aptitude have counseling available on the possibilities of continuing in advanced industrial arts courses in high school? ... ... ND NA 1 2 3 4

20. Do students with industrial arts aptitude have counseling available on possibilities of continuing postsecondary industrial arts study? ... ... ND NA 1 2 3 4

Evaluations

a) How effectively do instructional activities relate to student needs and program goals? ... ... ND NA 1 2 3 4

b) How adequate is the planning and preparation for instructional activities? ... ... ND NA 1 2 3 4

c) How effectively do instructional activities meet community needs? ... ND NA 1 2 3 4

d) How adequately are the students' needs for leisure-time activities being met? ... ... ND NA 1 2 3 4

e) How effectively do teachers work with staff in other academic areas to provide more effective instruction? ... ... ND NA 1 2 3 4

Comments

C. Instructional Materials

Checklist

1. To what extent are current resource units and teaching guides of the city, county, or state available? ... ... ND NA 1 2 3 4

2. Are up-to-date textbooks available? .... ND NA 1 2 3 4

3. To what extent are appropriate reference materials available in each area? ... ... ND NA 1 2 3 4

4. Are descriptive materials and commercial products available for instruction? ... . ND NA 1 2 3 4

5. Are posters, charts, graphs, and pictures available? ... . ND NA 1 2 3 4

6. Are teaching aids consisting of miniature, cutaway, and actual-size projects and devices provided? ... ND NA 1 2 3 4

7. Are programmed instructional materials available? ... . ND NA 1 2 3 4

8. To what extent are teacher-prepared materials such as study guides, course outlines, and resource units available? ... ... ND NA 1 2 3 4

Evaluations

a) How extensively are teaching guides used? ... . ND NA 1 2 3 4

b) To what degree are good quality and appropriate texts and reference materials available? ... ... ND NA 1 2 3 4

c) How adequate is the variety of instructional resources? ... ... ND NA 1 2 3 4

Comments

IV. DIRECTION OF LEARNING (Cont'd)

D. Methods of Evaluation

Checklist

1. To what extent is evaluation considered an integral part of the teaching-learning process? ... ND NA 1 2 3 4

2. Is a continuous program of evaluation employed to determine the extent to which students achieve established goals or objectives? ... ND NA 1 2 3 4

3. Does student participation in the evaluation procedures a part of the learning situation? .... ND NA 1 2 3 4

4. To what extent do industrial arts teachers carefully record objective data and anecdotal information? ..... ND NA 1 2 3 4

5. Are periodic evaluations made of current course content and methods? ... ND NA 1 2 3 4

6. Is evaluation of student progress based on a variety of related criteria and suitable techniques of appraisal? ND NA 1 2 3 4

7. To what extent evaluation related to differences among student aptitudes, abilities, and knowledge? .... ND NA 1 2 3 4

8. Is individual progress recorded and becomes a part of the cumulative record of the student, to be used for guidance purposes? ... ... ND NA 1 2 3 4

9. Are student judgments of industrial arts experiences secured near the end of courses and at specified times following graduation? .... ND NA 1 2 3 4

10. To what extent data obtained from tests and other evaluative devices are used to help students know what they have done well and what needs to be improved? ... ... ND NA 1 2 3 4

11. Are comparisons made between articles developed by students in the industrial arts program and commercial products? ND NA 1 2 3 4

12. Are records made of each student injury in the school shop and are they compiled and analyzed regularly? ND NA 1 2 3 4

13. Are industrial arts equipment and facilities inspected periodically by fire prevention and safety experts? .... ND NA 1 2 3 4

14. Is teacher self-evaluation conducted at regular intervals? .... ND NA 1 2 3 4

15. To what extent are evaluation instruments for appraisal of both factual content and manipulative activities used? ... . ND NA 1 2 3 4

Evaluations

a) How appropriate are the evaluation instruments? .... ND NA 1 2 3 4

b) How satisfactory are the evaluation procedures used in the program? ... ND NA 1 2 3 4

c) How effectively are changes implemented following an evaluation of the program? ... . ND NA 1 2 3 4

d) How satisfactory is the inspection of the school shop and its facilities? ND NA 1 2 3 4

Comments

V. OUTCOMES

Evaluations

a) To what extent do students possess a knowledge and understanding of the properties and use of important raw materials? ... ... ND NA 1 2 3 4

b) To what extent do students possess a knowledge and understanding of basic industrial processes? .... ND NA 1 2 3 4

c) To what extent are students developing a reasonable degree of skill in the use of basic tools and machines? ... ND NA 1 2 3 4

d) To what extent do students develop an ability to organize and perform their work efficiently? .... ND NA 1 2 3 4

e) To what extent are interests, aptitudes, and abilities in the industrial arts discovered and developed by students? ... ... ND NA 1 2 3 4

f) To what extent do students develop an appreciation of good design, construction, and craftsmanship? ... ND NA 1 2 3 4

g) To what extent are youth developing an ability to select, care for, and use industrial products intelligently ... ND NA 1 2 3 4

h) To what extent are students developing positive attitudes and good practices relating to safety? ... ... ND NA 1 2 3 4

i) How extensively do students develop constructive leisure-time activities or hobbies relating to the industrial arts? ... . ND NA 1 2 3 4

j) To what extent do students possess information about various industrial occupations and industries? ... ... ND NA 1 2 3 4

k) To what extent do students understand the phenomenon of technology, the role of the individual in relation to it, and its role in cultural exchange? ... . ND NA 1 2 3 4

1) To what extent do students understand and have an appreciation for labor-management problems? .... ND NA 1 2 3 4

VI. SPECIAL CHARACTERISTICS OF THE INDUSTRIAL ARTS PROGRAM

1. In what respects is the industrial arts program most satisfactory and commendable?

2. In what respects is the industrial arts program most in need of improvement?

3. Recommend, in order of priority, steps for improvement of weaknesses in the industrial arts program.

APPENDIX C

PARTICIPATING SCHOOLS - THOSE SCHOOLS VISITED - THOSE SCHOOLS THAT RETURNED INSTRUMENTS.

APPENDIX C

Government Secondary Schools	Schools Visited	Schools Returned Instruments
Bushlot (central Corentyne)		
Manchester		
New Amsterdam	x	x
Kwakwani		x
Rosignol	x	
Bushlot	x	
Mahaicony	x	x
Bygeval	x	x
Golden Grove	x	x
Bladen Hall	x	
Buxton	x	
Annandale	x	x
Cummings Lodge	x	x
Campbellville	x	
North Georgetown	x	x
South Georgetown	x	x
Bishops	x	
Christ Church	x	x
Saint Stanislaus	x	
Charlestown	x	x
Lodge	x	x
East Ruimveldt	x	x
North Ruimveldt	x	
Wismar		

APPENDIX C (Continued)

West Demerara	x	x
Patentia	x	x
Zeeburg	x	x
Vergenoegen	x	x
Johanna Cecila	x	
Anna Regina		
Bartica		